# Contents


**Volume 1**

Publisher's Note xiii
About the Editor xv
Introduction xvii
Topic Finder xix
List of Contributors xxvii

Illustrations

Marine and Oceanic Biome/
Great Barrier Reef 2
Inland Aquatic Biome/New England Pond 4
Desert Biome/Sonoran Desert 6
Forest Biome/European Boreal Forest 8
Rainforest Biome/Amazon Basin Rainforest 10
Grassland Biome/African Savanna 12
Tundra Biome/Siberian Tundra 14
Human (Anthropogenic) Biome/
American Suburb 16

Part 1: Overviews

*Marine and Oceanic Biomes*

Coastal Seas 19
Coastal Wetlands 24
Continental Shelves 28
Coral Reefs and Seagrass Beds 33
Estuaries, Bays, Lagoons, and Coastal Rivers 39
High Latitude Oceanic Regions 45
Intertidal Zones 49
Tropical and Subtropical Oceanic Regions 54
Upwelling Ecosystems 55

*Inland Aquatic Biomes*

Freshwater Lakes 61
Great Lakes 66
Ponds 71
Rivers 76
Saline Lakes 81
Streams 86
Wetlands 92

*Desert Biomes*

Coastal Deserts 99
Mid-Latitude Deserts 103
Paleodeserts 108
Polar Deserts 111
Rain Shadow Deserts 116
Trade Wind Deserts 121

*Forest Biomes*

Boreal Forests and Taiga 127
Mediterranean Forests 130

*Forest Biomes (continued)*
Montane Forests 135
Plantation Forests 138
Subtropical Forests 142
Temperate Coniferous Forests 149
Temperate Deciduous Forests 152
Tropical Rainforests 157
Tropical Seasonal Forests 163

*Grassland, Tundra, and Human (Anthropogenic) Biomes*
Agroecosystems *169*
Montane Meadows 174
Pasture Lands 176
Temperate Grasslands 180
Tropical and Subtropical Grasslands 185
Tropical Savannas 191
Tundra Ecosystems 197
Urban and Suburban Systems 200

**Volume 2**
Part 2: Articles

**A**
Acacia-Commiphora Bushlands and Thickets *209*
Acadia Intertidal Zones 211
Ad Dahna Desert 214
Aden, Gulf of 216
Adriatic Sea 218
Aegean Sea 220
Alaska Peninsula Montane Taiga 223
Albemarle-Pamlico Sound 225
Albert, Lake (Africa) 227
Albertine Rift Montane Forests 229
Aldabra Atoll 230
Allegheny Highlands Forests 232
Alps Conifer and Mixed Forests 235
Amazon River 238
Amu Darya River 243
Amur River 246
Anatolian Conifer and Deciduous Mixed Forests 247
Anatolian Steppe, Central 249
Andaman Sea 251
Andean Montane Forests, Northwestern 253
Andean Páramo Grasslands 255
Andean Puna Grasslands, Central 257
Andros Barrier Reef 259
An Nafud Desert 261
Antarctic (Southern) Ocean 263
Apalachicola Bay 265
Apo Coral Reef 267
Appalachian-Blue Ridge Forests 270
Appalachian Mixed Mesophytic Forests 272
Arabian Sea 275
Arafura Sea 278
Arafura Swamp 280
Aral Sea 282
Araya and Paria Xeric Scrub 284
Arctic Desert 286
Arctic Ocean 289
Arctic Tundra, High 292
Arctic Tundra, Low 293
Argentine Monte 295
Arizona Mountains Forests 298
Arkansas River 300
Arnhem Land Tropical Savanna 303
Ascension Scrub and Grasslands 306
Ashmore Reef 308
Atacama Desert 310
Atchafalaya Swamp 312
Athabaska, Lake 314
Atlantic Coastal Forests, Middle 316
Atlantic Coastal Forests, Southern 319
Atlantic Equatorial Coastal Forests 321
Atlantic Ocean, North 323
Atlantic Ocean, South 326
Australian Alps Montane Grasslands 329
Australian Temperate Forests, Eastern 331
Australia Woodlands, Southwest 333
Azores Temperate Mixed Forests 335

**B**
Baffin Bay 337
Baffin Coastal Tundra 339
Bahia Forests 341
Baikal, Lake 343
Baja California Desert 346
Balkhash, Lake 349
Baltic Sea 351
Bangweulu Wetlands 354
Banrock Station Wetlands 356
Barataria-Terrebonne Estuary 357

Barents Sea 359
Belize Barrier Reef Reserve System 362
Bengal, Bay of 364
Beni Savanna 366
Bering Sea 368
Bikar Atoll 370
Black Sea 372
Blue Mountains Forests 374
Borneo Rainforests 377
Brahmaputra River 380
Brahmaputra Valley Semi-Evergreen Forests 382
Brigalow Tropical Savanna 384
Brisbane River 386
British Columbia Mainland Coastal Forests 388
Brooks-British Range Tundra 390
Buru Rainforest 392

C

Caatinga Dry Woodland 395
Cabayugan River 397
California Central Valley Grasslands 400
California Chaparral and Woodlands 402
California Coastal Forests, Northern 404
Camargue Wetlands 406
Cameroon Savanna Plantation Forests 408
Campos Rupestres Montane Savanna 410
Canary Islands Dry Woodlands and Forests 412
Candaba Swamp 414
Cardamom Mountains Rainforests 416
Caribbean Sea 418
Caroni Swamp 421
Carpathian Montane Conifer Forests 423
Carpentaria Tropical Savanna 424
Cascades Forests, Eastern 426
Caspian Lowland Desert 429
Caspian Sea 431
Caucasus Mixed Forests 433
Celtic Broadleaf Forests 435
Central American Atlantic Moist Forests 437
Central American Montane Forests 439
Cerrado Grasslands 441
Chad, Lake 443
Chad, Lake, Flooded Savanna 445
Chagos Archipelago 446
Cham Islands Coral Reefs 448
Champlain, Lake 450
Chatham Island Temperate Forests 452
Chesapeake Bay 454
Chihuahuan Desert 457
Chilean Matorral Forests 460
Chile Intertidal Zones 461
China Loess Plateau Mixed Forests, Central 463
Chittagong Hill Tracts Plantation Forests 465
Christmas and Cocos Islands Tropical Forests 466
Chukchi Sea 469
Clipperton Island 471
Coiba Island Coral Reefs 473
Colorado Plateau Shrublands 474
Colorado River 478
Colorado Rockies Forests 480
Columbia River 482
Congaree Swamp 484
Congolian Lowland Forests 486
Congolian Swamp Forests 488
Congo River 490
Connecticut River 492
Coongie Lakes 494
Cooper Creek 496
Copper Plateau Taiga 498
Coral Triangle 501
Córdoba Montane Savanna 503
Costa Rican Seasonal Moist Forests 505
Cyprus Mediterranean Forests 507

D

Danube Delta 511
Danube River 514
Darling River 517
Dead Sea 519
Deccan Plateau Dry Deciduous Forests 521
Dee Estuary 523
Diamantina River 525
Dnieper River 527
Dongsha Islands 530
Don River 531
Dry Valleys Desert 533

E

East African Montane Forests 537
East China Sea 539
East Siberian Sea 541
Ecotourism 543
Edwards Plateau Savanna 546

Elbe River 548
Erie, Lake 551
Ethiopian Montane Moorlands 554
Euphrates River 556
European Broadleaf Forests, Western 559
Everglades Wetlands 561
Eyre, Lake 565

F

Fernando de Noronha Archipelago 567
Fisheries 569
Florida Keys Coral Reef 573
Fraser River 577
Fundy, Bay of 578

G

Galápagos Islands Xeric Scrub 581
Gambia River 584
Ganges River 586
Ghats Montane Rainforests, Northwestern and Southwestern 589
Gibson Desert 592
Gironde Estuary 594
Gobi Desert 596
Godavari Estuary 599
Gondwana Rainforest 600
Great Barrier Reef 602
Great Basin Desert 605
Great Basin Montane Forests 607
Great Bay Estuary 609
Great Bear Lake 611
Great Black Swamp 613
Great Cypress Swamp 615
Great Dismal Swamp 617
Great Lakes Forests 619
Great Salt Lake 622
Great Sandy-Tanami Desert 625
Great Slave Lake 626
Great Victoria Desert 629
Guyanan Savanna 631

Volume 3

H

Hauraki Plains Wetlands 637
Hawaiian Intertidal Zones 639
Hawaiian Tropical Moist Forests 641
Hawaiian Tropical Shrublands 643
Highveld Grasslands 645
Himalayan Alpine Shrub and Meadows, Eastern 647
Himalayan Alpine Shrub and Meadows, Western 649
Himalayan Broadleaf Forests 652
Himalayan Subalpine Conifer Forests 654
Himalayan Subtropical Pine Forests 656
Hokkaido Montane Conifer Forests 658
Honey Island Swamp 660
Hudson Bay 662
Hudson Bay Lowlands 664
Hudson River 666
Huetar Norte Plantation Forests 669
Humber Estuary 671
Huntsman Valley (Tasmania) Plantation Forests 672
Huron, Lake 674

I

Iberian Conifer Forests 677
Iceland Boreal Birch Forests and Alpine Tundra 679
Indian Ocean 681
Indian Ocean Islands (Southern) Tundra 684
Indochina Dry Forests, Central 686
Indochina Subtropical Forests 687
Indus River 689
Indus Valley Desert 691
Irrawaddy Moist Deciduous Forests 693
Irrawaddy River 695
iSimangaliso Wetlands (St. Lucia Estuary) 698
Italian Sclerophyllous and Semi-Deciduous Forests 700
Itigi-Sumbu Thicket 702

J

Japan, Sea of 705
Java-Bali Rainforests 708
Jordan River 710
Junggar Basin Semi-Desert 712

K

Kafue Flats 715
Kakadu Wetlands 717

Kakamega Rainforest 719
Kalaallit Nunaat Arctic Tundra 721
Kalahari Desert 723
Kalahari Xeric Savanna 726
Kalimantan (Indonesia) Rainforests 727
Kara Sea 730
Kazakh Steppe 732
Kennebec Estuary 734
Kimberley Tropical Savanna 735
Kinabalu Montane Alpine Meadows 738
Klamath Estuary 739
Klamath-Siskiyou Forests 742
Kuitpo Plantation Forest 745

L

Ladoga, Lake 747
Lake Télé-Lake Tumba Swamps 749
Lakshadweep Coral Reefs 751
Laptev Sea 753
Leeward Islands Xeric Scrub 755
Lena River 757
Limpopo River 759
Logging Industry 760
Loire River 765
Long Island Sound 767
Lord Howe Island Subtropical Forests 769
Luang Prabang Montane Rainforests 772
Lukanga Swamp 773
Luzon Rainforest 775

M

Mackenzie River 779
Madagascar Lowland Forests 781
Madeira Evergreen Forests 783
Magdalena River 785
Magdalena Valley Montane Forest 787
Magellanic Subpolar Forests 790
Malabar Coast Moist Forests 792
Malawi, Lake 793
Maldives 795
Mana Pools 797
Manchurian Mixed Forests 800
Mannar, Gulf of, Coral Reefs 801
Maracaibo, Lake 803
Marajó Varzea Forests 805
Marielandia Antarctic Tundra 807
Maudlandia Antarctic Desert 808
Mediterranean Conifer-Sclerophyllous-Broadleaf Forests, Eastern 811
Mediterranean Sea 812
Meghalaya Subtropical Forests 815
Mekong Delta 817
Mekong River 820
Mesoamerican Barrier Reef 822
Mexican Wetlands, Central 824
Mexico, Gulf of 826
Michigan, Lake 828
Middle East Steppe 831
Mid-Pacific Gyre 833
Mingo Swamp 835
Miombo Woodlands 837
Mississippi Lowland Forests 839
Mississippi River 841
Missouri River 844
Mojave Desert 847
Mongolian-Manchurian Grassland 849
Montana Valley and Foothill Grasslands 851
Monte Alegre Varzea Forests 853
Monterey Bay Intertidal Zone 855
Mount Desert Island Intertidal Zone 857
Murray River 859
Murrumbidgee River 861
Muskwa-Slave Lake Forests 862

N

Namib Desert 865
Namibian Savanna Woodlands 869
Nariva Swamp 871
Narragansett Bay 873
Nasser, Lake 875
Nebraska Sand Hills Desert 877
Nelson River 880
Nenjiang River Grassland 882
New Caledonia Barrier Reef 884
New Caledonia Dry Forests 886
New England-Acadian Forests 888
New Guinea Freshwater Swamp Forests 891
New Jersey Pine Barrens 894
New Zealand Intertidal Zones 896
Nicaragua, Lake 898
Nicoya, Gulf of 900
Niger Delta Flooded Savanna, Inner 902
Niger Delta Swamp Forests 904
Niger River 906

Nikumaroro Coral Atoll 908
Nile Delta Flooded Savanna 910
Nile River 913
Ningaloo Coral Reef 915
Niue Island Coral 917
North Sea 919
Northwestern Mixed Grasslands 921
Novel Ecosystems 923
Nubian Desert 926

O

Ob River 929
Oder River 931
Ogilvie-Mackenzie Alpine Tundra 933
Ohio River 935
Okanagan Dry Forests 938
Okavango Delta 939
Okeechobee, Lake 941
Okefenokee Swamp 944
Okhotsk, Sea of 947
Olango Island Group Coral Reef 949
Oman, Gulf of, Desert and Semi-Desert 950
Onega, Lake 952
Ontario, Lake 954
Orange River 957
Orinoco River 959
Orinoco Wetlands 962
Ozark Mountain Forests 964

P

Pacific Coastal Forests, Northern 967
Pacific Ocean, North 969
Pacific Ocean, South 972
Pallikaranai Wetland 977
Pamir Alpine Desert and Tundra 978
Pantanal Wetlands 980
Papahanaumokuakea Coral Reefs 982
Papuan Rainforests, Southeastern 984
Paraguay (Eastern) Plantation Forests 986
Parana River 987
Parramatta River Estuary 990
Patagonia Desert 991
Patagonian Grasslands 994
Peninsular Malaysian Rainforests 996
Persian Gulf 997
Persian Gulf Desert and Semi-Desert 1000
Pescadero Marsh 1002
Phang Nga Bay 1004
Philippine Sea 1006
Pindus Mountains Mixed Forests 1008
Piney Woods Forests 1010
Po River 1012
Potomac River 1014
Puget Lowland Forests 1017
Puget Sound 1020
Pulley Ridge Coral Reef 1023
Purus Varzea Forests 1024
Pyramid Lake 1026

Volume 4

Q

Qilian Mountains Subalpine Meadows 1033
Queensland Tropical Rainforests 1035

R

Rajasthan Desert 1039
Rann of Kutch Seasonal Salt Marsh 1041
Red Butte Creek 1043
Red River of the North 1045
Red River of the South 1046
Red Sea 1048
Red Sea Coral Reefs 1051
Reelfoot Lake 1053
Rennell Island 1054
Rhine River 1056
Rhône River 1059
Riau Plantation Forests 1061
Rietvlei Wetland 1063
Rio de La Plata 1065
Rio Grande 1067
Rio Plátano 1070
Rocas Atoll 1072
Rogerstown Estuary 1074
Rub' al Khali Desert 1076
Rural Areas 1078
Ryukyu Islands 1082

S

Sahara Desert 1085
Sahelian Acacia Savanna 1087
Salcombe-Kingsbridge Estuary 1089
Salween Estuary 1091

Salween River 1093
San Andres Archipelago Coral Reefs 1094
San Francisco Bay 1096
San Lucan Xeric Scrub 1099
San Mateo (California) Creek 1100
Santa Marta Montane Forests 1103
São Francisco River 1105
Sargasso Sea 1107
Saskatchewan River 1109
Saya de Malha Bank 1111
Scandinavian Coastal Conifer Forests 1113
Scheldt River 1115
Scotia Sea Islands Tundra 1117
Sechura Desert 1119
Seine River 1121
Senegal River 1123
Serengeti Volcanic Grasslands 1125
Serra do Mar Coastal Forests 1127
Severn Estuary 1129
Shark Bay 1131
Shetland Islands Intertidal Zone 1133
Shu Swamp 1135
Siberian Broadleaf and Mixed Forests, West 1136
Siberian Coastal Tundra, Northeast 1139
Sierra Madre Pine-Oak Forests 1141
Sierra Nevada Forests 1142
Simpson Desert 1145
Sitka Spruce Plantation Forest 1148
Slums 1150
Snake-Columbia Shrub Steppe 1154
Snake River 1157
Solomon Islands Rainforests 1159
Sonoran Desert 1160
South China Sea 1163
Spain (Northeastern) and France (Southern) Mediterranean Forests 1166
Spratly Islands 1168
Srebarna Lake 1169
Sri Lanka Rainforests 1171
St. Lawrence River 1173
Stromlo Plantation Forest 1176
Suburban Areas 1179
Sudanian Savanna 1183
Sudd Wetlands 1185
Suncheon Bay Wetlands 1188
Sundarbans Wetlands 1189
Superior, Lake 1191
Swan River (Australia) Estuary 1194
Syrian Desert 1196

T

Tahoe, Lake 1199
Takla Makan Desert 1202
Talamancan Montane Forests 1203
Tamaulipan Matorral 1206
Tanami Desert 1207
Tanganyika, Lake 1209
Tasman Sea 1212
Tengger Desert 1214
Tepuis Forests 1216
Terai-Duar Savanna and Grasslands 1218
Texas Blackland Prairies 1219
Thames River 1221
Thar Desert 1224
Tian Shan Desert 1227
Tibetan Plateau Alpine Steppe, Central 1229
Tigris-Euphrates Alluvial Salt Marsh 1231
Tigris River 1233
Titicaca, Lake 1235
Tocantins River 1237
Tonlé Sap Wetlands 1239
Torngat Mountain Tundra 1241
Tubbataha Reef 1243
Turkana, Lake 1245
Tyrrhenian-Adriatic Sclerophyllous and Mixed Forests 1247

U

Ural River 1249
Urban Areas 1251
Uruguayan Savannas Pampa Grasslands 1255
U.S. Hardwood Forests, Central 1257
Uvs Nuur, Lake 1260

V

Valdivian Temperate Forests 1263
Vanuatu Rainforests 1265
Vasyugan Swamp 1267
Veracruz Coral Reef System 1270
Victoria, Lake (Africa) 1271
Vistula Estuary 1274
Volga River 1276
Volta River 1278

W

Wadden Sea 1281
Wakatobi Archipelago Coral Reefs 1283
Wasatch and Uinta Montane Forests 1286
Wasur Wetlands 1287
Water Management 1289
White Sea 1294
Willamette Valley Forests 1296
Windward Islands Xeric Scrub 1298
Wingello State Forest 1299
Winnipeg, Lake 1301
Wyoming Basin Shrub Steppe 1304

X

Xi River 1307

Y

Yala Swamp 1311
Yalu River 1312
Yangtze River 1314
Yellow (Huang He) River 1317
Yellow Sea 1320
Yenisei River 1322
Yukon-Alaska Alpine Tundra, Interior 1325
Yukon Interior Dry Forests 1327
Yukon River 1329

Z

Zacatonal 1333
Zagros Mountains Forest Steppe 1335
Zambezian Cryptosepalum Dry Forests 1337
Zambezian Flooded Grasslands 1338
Zambezi River 1340
Zapata Swamp 1343

Chronology 1345
Glossary 1357
Resource Guide 1369
Index 1376