

Index

Page numbers in *italics* refer to Figures; page numbers in **bold** refer to Tables.

- Aalenian
 - Middle Bathonian 103–107
 - Sandy Point Formation 564–565
 - Sverdrup Basin facies 556
 - Sverdrup Basin sequence 555
 - Upper Absaroka III Pliensbachian 103
 - Absaroka. *See* Lower Absaroka I Bashkirian Kasimovian; Upper Absaroka I Ladinian
 - ACEX site
 - burial history models 763
 - stratigraphy 737
 - Admiralteysky Megaswell 263. *See also* Northern Barents Basin
 - Admiralty Arch
 - assessment results 307
 - assessment unit 306–307
 - geological analogues for assessment 301–302
 - geology and petroleum potential 295–307
 - Kolguyev Terrace assessment unit 302–304
 - North Barents Basin assessment unit 305–306
 - Novaya Zemlya Basins and Admiralty Arch assessment unit 306–307
 - petroleum occurrence 295–296
 - province boundary definitions 295
 - South Barents Basin and Ludlov Saddle assessment unit 304
 - tectono-stratigraphic evolution 296–299
 - total petroleum system 299–301
 - Admiralty Arch Provinces
 - assessment ratios **306**
 - co-product ratios, ancillary data and depths **305**
 - map of structural features 296
 - Admiralty High 332
 - Agardhbukta unidirectional crossbedding 257
 - Alaska. *See also* Arctic Alaska
 - North Slope
 - exploration 133
 - map 502
 - tectonic elements 468
 - terranes of Siberian affinity 470–472
 - Alaska passive margin
 - charge 521
 - petroleum potential 520–522
 - Albian strata
 - Amerasia Basin source rocks 762
 - Arctic North America petroleum system 458
 - Alekseevsko Gulyaevskiy Swell 339
 - Alexander terrane 475
 - Alpha Ridge
 - geophysical exploration 698
 - recorded wavefields 211
 - seismic compressional wave velocity 775
 - seismograms and ray tracing 402
 - Amauligak field 533
 - Amauligak Trough
 - seismic profiles 533
 - Amerasia Basin
 - aeromagnetic evidence 785
 - basement character 775–782
 - contrasts in geological and velocity structure 776–780
 - diapiric uplifts of serpentinized peridotite in OCT domain 781
 - gravity features 775–776
 - lower Northwind Escarpment aeromagnetic domain 781–782
 - magnetic anomaly 776
 - seafloor spreading domains 776
 - burial history models 764
 - Canadian Arctic continental margin 696
 - extensional basins 326
 - geology and tectonic development 771–796
 - geophysical exploration 696–698
 - hydrocarbon potential speculation 796
 - opening 782–787
 - Chukchi Microcontinent rotational emplacement 785–786
 - OCT domain eastern boundary 782–784
 - OCT domain western boundary 785
 - Phase 1 extension 782–785
 - Phase 2 extension 786–787
 - postulated tectonic development 792, 793, 794
 - seafloor spreading 7
 - source of data 772–775
 - aeromagnetic studies 773–774
 - bathymetry 772–773
 - geological studies 774
 - gravity studies 774
 - present investigation 774–775
 - seismic studies 773
 - stratigraphy and structure of layer 1 787–793
 - Canada Basin sedimentary rocks thickness 789
 - Layer 1 post rift and synrift sequence 787–789
 - Layer post rift sequence chronostratigraphy 790–791
 - Layer 1 post rift sequence chronostratigraphy 789–790
 - Layer 1 velocity structure 789
 - Neocomian 791–792
 - Northwind Basin formation by crustal extension 793
 - reflection unit Klu 790
 - reflection unit Ku 790
 - reflection unit Q 789
 - reflection unit Tem-Tpal 790
 - reflection unit Tm-Teu 789
 - reflection unit Tp 789
 - relative subsidence of Canada Basin to Northwind Ridge 792–793
 - sedimentary rocks thickness 789
 - synrift sequences 791–792
 - tectonically significant unconformity 791
 - unconformity at base unit Klu 790–791
 - tectonic framework 773
 - tectonic history 793–795
 - emplacement of Alpha Mendeleev Large Igneous Province 795
 - initial opening 793–794
 - Layer 1 deformation in Canada Basin 795
 - Mid-Eocene to Miocene convergence 795
 - Northwind Basin creation by Late Paleocene 795
 - Phase 1 opening 794–795
 - Phase 2 opening 795
 - rotational emplacement of Chukchi Microcontinent 795
 - tectonic models 55
- Amundsen Basin
 - burial history model 740, 744
 - geophysical exploration 695
 - seismic data and interpretations 736
- Amundsen Basin Assessment Unit 747–748
 - charge 747
 - rocks 747–748
 - timing 748
- Anastasyevskoe local uplift
 - AVO attributes 365
 - seismic records anomalies 367
- Anisian 1 sequence boundary
 - seismic profile 253
- Antler Orogeny 94
 - palaeogeography 477
- Anyui Suture
 - extension 318
 - Western South 316–319
 - boundaries of AACM 318–319
 - space problem 316–318
 - zone 374
- Aptian strata
 - Amerasia Basin source rocks 762
 - palaeogeographic map 351
 - Upper Zuni I Barremian 108–113
 - Upper Zuni II Albian 114
- Arctic
 - assembly of Pangea supercontinent 6
 - disassembly of Pangea supercontinent 6
 - drilling proposals 712
 - Eastern
 - hydrocarbon resources 447–448
 - offshore Russian Arctic basins 439–441
 - petroleum system 440
 - Russian Arctic Shelf resources 348–349
 - stratigraphy of well-known basins 9
 - economic basement 7

- Arctic (*Continued*)
 extensional basins 325–330
 four-fold grouping of tectonic provinces 3
 intracratonic rifting 326–327
 major oil basins locations 752
 oldest petroleum system 10
 palaeogeography map 6
 petroleum exploration 11
 petroleum geology 8–12
 discovered petroleum systems 10–11
 exploration 8–9
 future petroleum provinces 11–12
 source rocks 9–10
 petroleum resources 12
 petroleum systems 13
 previous geology compilations 1–2
 regional magnetic domains 57–58
 sedimentary basins stratigraphy and geological history 6–8
 simplified field map of tectonic provinces 4–5
 state of knowledge 12–13
 structure 6
 Western stratigraphy 84
 wildcat wells, discoveries 2
- Arctic Alaska
 Brookian Sequence 492
 chronostratigraphy 488, 511
 fold-and-thrust belt 494
 margin 697
 oil-prone source-rock systems 489
 petroleum discoveries 495
 petroleum province
 charge considerations 490–495
 fold-and-thrust belt 493–495
 petroleum potential 490–491
 petroleum systems 490
 Platform 491–493
 thermal maturity 490
 geological framework 485–489
 geology and petroleum potential 485–496
 stratigraphy 487–489
 petroleum resource assessment 496
 petroleum resources 495
 petroleum systems plots 493
 quadrant. *See* Chapter 2 foldout
 stratigraphic and structural relations 486
 structure contour map 491
 tectono-stratigraphic features 486
- Arctic Alaska Chukotka microcontinent (AACM) 316–318
- Arctic Alaska fold-and-thrust belt 493–495
 assessment 495
 assessment units 494
 charge 494
 petroleum province 494
 rocks 494
 timing 494
- Arctic Alaska Platform 491–493
 assessment 492–493
 assessment units 494
 charge 491
 petroleum province
 charge considerations 491
 rocks 491–492
 timing 492
- Arctic basins
 annual number of hydrocarbon discoveries 133
 discovered liquids and natural gas 138
 discovered resources 133–134
 discovery history, discovered resources and petroleum systems 131–143
 drilling, discovery and success 134
 giant and supergiant fields 135
 giant hydrocarbon discoveries location 136
 hydrocarbon finds 131–143
 percentage distribution 137
 petroleum exploration history of Arctic basins 131–133
 petroleum systems 134–143, 340
 Eastern Hemisphere 139–143
 Barents Sea Platform 142
 Dzhangodskaya–Malyshevskaya 143
 East Barents Sea Basin 142
 Lena Anabar Basin 142–143
 Tanopchinskaya–Marresalinskaya 143
 Timan Pechora Basin 143
 Trondelag Platform 139
 Vestspitsbergen Trough 142
 West Barents Shelf Edge 142
 Western Siberia Basin 143
 Yanovstanskaya 143
 Yenisey Khatanga Basin 143
- IHS IRIS21 petroleum geological model 134–137
- Western Hemisphere 137–139
 Arctic Fold Belt 138
 Boundary Creek Smoking Hills Taglu 139
 Brooks Range Province 138
 Eagle Plain Basin 138–139
 GRZ-Nanushuk 138
 Husky/Mount Goodenough Parsons Group 139
 Lisburne Barrow 138
 Mackenzie Delta 139
 Northern Interior Platform 139
 Shublik/Hue Shale 138
 Sverdrup Basin 139
- proven plus probable 137
 proven plus probable discovered 137
 resource distribution geology 134
- Arctic Canada
 Aalenian Sandy Point Formation (sample C403747) 564–565
 analytical methods 559–560
 Carnian Pat Bay Formation (sample C403503) 563
 Early Triassic Blind Fiord Formation (sample C403730) 563
 geological setting 559
 Pliensbachian Heiberg Formation (sample C403752) 563–564
 results 560–563
 Tithonian Deer Bay Formation 565
 U–Pb SIMS zircon geochronology of Triassic and Jurassic sandstones 559–565
- Arctic Circle north
 Circum-Arctic aggregation estimates 160
 estimated maximum accumulation size 159–160
 estimating resources in Assessment Units 154–156
 mapping Arctic and defining Assessment Units 151–154
 oil and gas resource potential 151–160
 risk assessment and marginal assessment unit probability 154
 undiscovered natural gas in gas accumulation 156–159
 undiscovered oil 156
- Arctic Fold Belt petroleum systems 138
- Arctic Islands carbon and hydrogen isotopes 575
- Arctic North America
 data density 452
 genetic evolution 451–460
 geodynamic timing chart 453
 implications for petroleum systems 451–460
 petroleum system 455
 Albian 458
 Early Jurassic 456
 Eocene 459
 Late Jurassic 458
 Paleocene 459
 Triassic 456
 petroleum systems 453–457
 Cretaceous petroleum systems 457
 Early Jurassic petroleum systems 454
 Early Palaeozoic petroleum systems 454
 Eocene petroleum systems 457
 Late Devonian and Early Carboniferous petroleum systems 454
 Late Jurassic petroleum systems 454–457
 Paleocene petroleum systems 457
 Triassic petroleum systems 454
 tectonic framework 451–453
- Arctic North Atlantic Gateways
 high northern latitudes 708–710
- Arctic Ocean. *See also* Central Arctic Ocean
 ambient noise levels 688
 autonomous seismic data buoy 695
 bathymetry 686
 geophysical exploration 685–698
 Amerasia Basin 696–698
 Amundsen and Nansen basins 695
 Arctic margin of Alaska 697
 Canada Basin 698
 Canadian Arctic continental margin 696

- Chukchi Borderland 697
 East Siberian Sea continental margin 697
 Eurasia Basin 695
 Gakkel Ridge spreading centre 695
 Laptev Ridge northslope 695
 Laptev Sea continental margin 695
 Lomonosov Ridge-Makarov Basin margin 697–698
 marginal plateaus 695–696
 Morris Jesup 695–696
 submarine ridges-Alpha and Mendelejev ridges 698
 submarine ridges-Lomonosov Ridge 698
 Svalbard Severnaya Zemlja continental margin 695
 Yermak Plateau 696
 gravity map 694
 ice drift patterns 687
 magnetic field intensity 694
 physical environment 685–688
 ambient noise 686–687
 sea ice 685–686
 wave propagation 687
 working conditions in pack ice 687–688
 physical environment, survey techniques 685–698
 physiographic features 772
 recording sonobuoys 690
 research platform alternatives 688–694
 aerosurveys 692–693
 autonomous underwater vehicles 693–694
 hovercraft 693
 icebreakers 690–691
 ice drift stations 688–690
 nuclear submarines 691–692
 Russia and Norway 716–717
 scientific drilling 698
 seismic data 689
 surrounding coastal states 716
 tracks of seismic reflection data 696
Arctic Region
 after closure of Rheic Ocean 19
 configuration of continents and ocean basins 20
 crustal settings of sedimentary successions 20
 Early Palaeozoic terrane 66
 End Carboniferous 71–72
 features displayed on map 20–21
 faulty, deformation fronts and structural transitions 21
 isopachs 21
 sedimentary successions 20
 synoptic boxes 20–21
 first-order structural environments 22
 free-air gravity map 755
 geological provinces 132
 hydrocarbon potential 17, **18**
 hydrocarbon prospectivity 22
 initial Palaeozoic palaeo-positions 62–65
 Late Ordovician to Early Devonian 67–68
 Late Ordovician to Early Silurian 18
 magnetic map 754
 mapping methodology 79–121
 Kaskaskia I 93–94
 Kaskaskia II 94–96
 Kaskaskia III 96
 Kaskaskia IV 96
 Lower Absaroka I 97–100
 Lower Absaroka IV 100–102
 Lower Tejas I 116–117
 Lower Tejas II 117–118
 Lower Tejas III 118–119
 Lower Zuni I 103–107
 Lower Zuni III 108
 Sauk I 79–81
 Sauk II 81–84
 Sauk III 84
 Sauk IV 84–87
 Slice 14, 100
 Tippecanoe I 87
 Tippecanoe II 87–89
 Tippecanoe III 90–91
 Tippecanoe IV 91–92
 Upper Absaroka I 103
 Upper Absaroka II 103
 Upper Absaroka III 103
 Upper Tejas I 119–120
 Upper Tejas II 120
 Upper Tejas III 120–121
 Upper Zuni I 108–113
 Upper Zuni II 114
 Upper Zuni III 114–115
 Upper Zuni IV 115–116
 Zuni II 108
 mid-Cretaceous 19
 Middle Devonian to Late Devonian 68–70
 Middle Mississippian to Late Pennsylvanian 70–71
 palaeoenvironment and lithofacies 82
 palaeogeographic and tectonic evolution 61–75
 palaeolithofacies maps 79–121
 Palaeoreconstruction 66, 67
 palaeoreconstruction for Late Devonian 71
 palaeoreconstruction for Middle Devonian 70
 palaeoreconstruction for Middle Mississippian 72
 palaeoreconstruction for Middle Pennsylvanian 73
 palaeoreconstruction for Palaeozoic end 74
 palaeoreconstruction of Arctic blocks 62, 63, 64
 Palaeozoic 65–67, 68–69
 Permian 72–73
 Phanerozoic palaeoenvironment 79–121
 Phanerozoic time table 80
 quadrants and sedimentary successions
 sedimentary accumulation **24–26**
 sedimentary successions 17–28
 across passive continental margins 23–27
 deposited on continents 22–23
 Lena and Mackenzie delta systems treatment 27
 on oceanic crust 27
 plate-tectonic content 18–20
 selection criteria 21–22
 time scale 21
Arctic Uralides
 Eurasian orogens and Arctic tectonics 313–315
 possible continuation 314
Arenigian
 global plate tectonic map 86
 palaeoenvironment and lithofacies 86
Article 76
 central Arctic Ocean 715–716, 718, 720
 Asselian palaeogeographic map 349
 Atlantic Margin geoseismic profile 272
 Autonomous seismic data buoy 695
 Autonomous underwater vehicles 693–694
Axel Heiberg
 Oxfordian Valanginian sequence 556
Axel Heiberg Island
 northwestern
 Aalenian Sandy Point Formation 562–563, 564–565
 analytical methods 559–560
 Carnian Pat Bay Formation 561–562, 563
 cathodoluminescence images of zircon grains 561
 cumulative frequency diagrams 562
 discussion 563
 Early Triassic Blind Fiord Formation 560–561, 563
 geological setting 559
 Pliensbachian Heiberg Formation 562, 563–564
 results 560–563
 samples **560**
 stratigraphic column 560
 Tithonian Deer Bay Formation 563, 565
 U–Pb detrital zircon ages 562
 zircon geochronology 559–565
Azolla event 10
Bache Peninsula
 platform carbonates 602
Baffin Bay Assessment Unit
 petroleum system events chart 640
 seismic data 639
 West Greenland East Canada Province 639–640
Baffin Bay Nares Strait region
 geological map 602
 refraction profiles 599
Baffin Bay region
 comparative seismic stratigraphies 605
 Cretaceous and Cenozoic basins 596

- Baffin Bay region (*Continued*)
 depth to basement from seafloor datum 600
 northwestern
 refraction profiles and velocity profiles 607
 size 598
 palaeogeography 615
 petroleum prospectivity 655
 seismic reflection and refraction profile 601
 untested structural targets 622
- Baffin Fan
 acoustic basement 612–613
 Arctic eastern Canada 610–613
 basins of northwestern Baffin Shelf 606
 Cambrian to Silurian platform 613
 canyon and channel-fill complex 612
 Carey Basin 609–610
 early spreading phase 615–616
 east of Lancaster Sound. *See* Chapter 40 foldout
 geological history 614
 geological setting 598–606
 continent ocean boundary 606
 Cretaceous and Danian 600–602
 ODP site 645 and other offshore records 603–604
 pre-Cretaceous record 598–600
 seismic stratigraphy 604–606
 Selandian and younger 602–603
- Glacier Basin 609
 hydrocarbon potential 619–622
 petroleum geology and structure 621
 potential resources 621–622
 setting 619–621
 interpreted reflection profiles. *See* Chapter 40 foldout
 inversion tectonics 616–618
 inverted rift system 595–624
 Jones Sound Basin 609
 Lady Ann Basin 608–609
 Lancaster Sound Basin 606–608
 Late Cretaceous and Danian rifting 615
 lowest post-Silurian succession 613–615
 Mesoproterozoic basin development 613
 North Water Basin 610
 Oligocene to middle Miocene sequence 611
 petroleum resource potential 595–624
 Plio-Pleistocene glaciomarine deposits 618–619
 post-spreading succession 618
 previous work 597–598
 resource-related features 620
 rift-related basins 606–610
 size 598
 stratigraphy 595–624
 tectonics 595–624
 Thanetian to Eocene sequences 610–611
 Upper Miocene to mid-Pliocene sequence 611
 Upper Pliocene and Pleistocene sequences 611–612
- Baffin Shelf and slope reflection profiles. *See* Chapter 40 foldout
 Bajocian Callovian sequence 554
 Balaena field 547
- Baltica
 Circum-Arctic Precambrian cratons 464–465
 detrital zircon data for terranes 473
 palaeogeography and development 476
 terrane palaeogeography 478
- Banks Island
 line 4925 540
 line 5690 539
 margin seismic profiles 536–538
 segment 529
- Barents Arch geoseismic section 181
 Barents Basin. *See* South Barents Basin
 Barents Kara region. *See also* East Barents Province; Northern Barents Basin
 deep seismic sounding 211
 geological–geophysical section 214, 215, 216, 217
 geophysical work on profiles 210
 gravimetric and magnetic measurements 214
 hydrocarbon systems 438
 quadrant. *See* Chapter 2 foldout
 reflection CDP 212
 sedimentary basin 437
 seismo-tomographic sections 213
 tectonic background 210
 three-dimensional model 212
- Barents Sea. *See also* East Barents Sea Basin; Greater Barents Sea; Northern Barents Sea; Russian Arctic Shelf of Barents Sea
 aeromagnetic surveys 200
 depth model according to geophysical survey results 209–221
 depth-to-basement 205
 four-way dipping dome structures 190
 geochemical data 178
 geoseismic profile 184
 gravity and magnetic data 198–201, 207
 crustal structure in depth 204–206
 evaluation and processing 199–201
 Franz Josef Land 203
 interpretation 201–206
 mapping tectonic features 202–204
 Marine area 204
 Moho crustal thickness 205–206
 Norwegian mainland 204
 Novaya Zemlya 203–204
 Russian mainland 204
 Svalbard 202–203
 top basement 204
 gravity anomaly 200, 201
 gravity measurements 199
 hydrocarbon generation and migration 342
 impact on prospectivity and petroleum systems 271–280
 integration of survey results 212–213
 isostatic residual map 202
 magnetic anomaly map 202
 Moho depth 206
 palaeogeographic history 197–198
 Palaeozoic to Cenozoic sedimentary cover 218–220
 Barents plate 218–219
 Mezenskaya syncline 218
 North Kara syncline 220
 South Kara syncline 219–220
 Taimyr Severozemelskiy fold system 220
 plate boundaries 198
 regional subcrop map 272
 relief 198
 Russian Arctic Shelf resources 348
 source rocks distribution 185
 structural interpretation 197–207, 203
 techniques 209–212
 deep seismic sounding 209–212
 gravimetric and magnetic measurements 212
 reflection CDP seismic works 212
 tectonic elements 327
 tectono-stratigraphic crustal units 213–218
 lower crust 213–214
 Upper crystalline crust 214–216
 Upper Proterozoic Palaeozoic complexes 216–218
- uplift and erosion 271–280
 effects on petroleum generation, migration and biodegradation 277–280
 effects on reservoir quality 276–277
 effects on seal capacity 277
 measuring net erosion and effect on petroleum accumulations 271–273
 net erosion estimates 273–276
 petroleum provinces with uplift 271
 well correlation 178
- West 11
 Cretaceous and Cenozoic structure 182
 geoseismic profile 273
 uplift maps 277
- Barents Sea Platform 142
 Barents shelf
 Arctic extensional basins 325–330
 Eurasian and Amerasian basins 326
 geological evolution and hydrocarbon potential 325–343
 intracratonic rifting 326–327
 Mesozoic source rocks 341
 oil and gas potential 339–341
 discoveries 339–340
 hydrocarbon generation 341
 petroleum systems 340–341
 Pechora syncline 338–339
 sedimentary cover of basins 327–331
 structural elements 331–339
 West petroleum systems 142

- Barents Shelf geoseismic profiles 333
 Barents Trough South and North 336
 Barremian strata in Amerasia Basin 760–762
 Basement's uplifts seismogeological model 335
 Basin analysis integration involved 452
 Basin development tectonic stages 335
 Basin Province 423
 Bathonian Middle Tithonian
 Zuni II Kimmeridgian 108
 Beaufort Foldbelt 535
 seismic profiles 532–533
 and Tuk segments 536
 Beaufort Mackenzie Basin
 resource-related features 620
 size 598
 Beaufort Sea. *See also* Canadian Beaufort Sea
 petroleum potential 527–541
 Beaufort shelf first-order chronostratigraphy 788
 Bjarmeland Platform stratigraphy and facies 180
 Bjorne Formation 550
 Bjørnøyrenna Fault Complex 189
 Blanknuten outcrop 258
 Blind Fiord Formation 560–561, 563
 Bolshezemlskiy Dome 339
 Borehole Observatory 711
 Botneheia Formation sequences 255
 Boundary Creek Smoking Hills Taglu 139
 Brookian Sequence 492
 Brooks Range Province 138
 Burdigalian Serravallian 120
 Burger locations. *See* Chapter 33 foldout
 Burial history
 analogues used in assessment 681–682
 charge 680–681
 field size distribution maximum field size oil-to-gas ration 682
 geological analysis of assessment unit probability 680–681
 ice conditions 682
 number of fields 681–682
 and petroleum generation modelling 680–682
 rocks 681
 timing and preservation 681

 Caledonian affinities northern 473
 Caledonian Beaufort Sea crustal framework 528
 Caledonian Orogeny 19
 Caledonian suture 311–312
 Caledonides northern 467–468
 Callovian age of Marie Bay 556
 Callovian facies Sverdrup Basin 556
 Cambrian 81–84
 Baffin Fan of Arctic eastern Canada 613
 Daldynain Toyonian 79–81
 global plate tectonic map 81, 83
 North American Cordillera rocks 471
 palaeoenvironment and lithofacies 83
 Sauk III Franconian Tremadocian 84
 Campanian
 Upper Zuni III Turonian 114–115
 Upper Zuni IV 115–116
 Canada. *See also* West Greenland East Canada Province
 exploration 133
 northern tectonic elements 468
 passive margin petroleum potential 520–522
 Canada Basin 55
 Arctic Alaska–Chukotka microplate (AACM) 317
 aeromagnetic anomalies 775
 aeromagnetic field 774
 basement character 775–782
 Canning Mackenzie deformed margin 519–520
 assessment 520
 charge 520
 rocks 520
 timing 520
 charge considerations 518–519
 crustal gravity 780
 Early Cretaceous provenance areas 513
 Eocene view 318
 geological framework 509
 geological transects. *See* Chapter 50 foldout
 geology and petroleum potential of rifted margins 509–523
 geophysical exploration 698
 hydrocarbon potential speculation 796
 Late Cretaceous provenance areas 513
 Lower Cretaceous 518–519
 magnetic anomalies 59
 map 510
 opening of Amerasia Basin 782–787
 Palaeogene 519
 palaeogene provenance areas 516
 palaeo-Pacific plate 320
 petroleum potential 519–522
 assessment 521–522
 charge 522
 passive margins 520–522
 petroleum resource assessment 521
 postulated tectonic development 792, 793, 794
 potential source rocks 518–519
 ratio of oil to gas accumulations 520
 reconnaissance isopach map 784
 recoverable petroleum resources 520
 rifted margins geology 510–518
 Canning–Mackenzie deformed margin 518
 Lower Cretaceous 511–512
 post-rift strata 511–516
 pre-rift strata 511
 rifted-margin sediment prisms internal structure 516–518
 rift shoulder geometry 510–511
 syn-rift strata 511–513
 Upper Cretaceous 514
 satellite altimetry free-air gravity anomaly 777
 schematic plate tectonic reconstruction 376
 sedimentary rocks thickness 789
 segments of reflection-seismic lines 512, 517
 seismic reflection profiles 776
 source of data 772–775
 aeromagnetic studies 773–774
 bathymetry 772–773
 geological studies 774
 gravity studies 774
 present investigation 774–775
 seismic studies 773
 stratigraphy and structure of layer 1 787–793
 stratigraphy and structure of layer 1 in Canada Basin
 Canada Basin sedimentary rocks thickness 789
 Neocomian 791–792
 relative subsidence 792–793
 synrift sequences 791–792
 tectonically significant unconformity 791
 tectonic framework 773
 tectonic history 793–795
 initial opening of Amerasia Basin 793–794
 Mid-Eocene to Miocene convergence 795
 Phase 2 opening of Amerasia Basin 795
 thermal maturation 519
 Upper Cretaceous 519
 Western 780
 arctic uplifted areas 274
 oceanic crust 779
 stratigraphy 783
 unmigrated seismic reflection. *See* Chapter 50 foldout
 Canada Rifted Margin Assessment Unit
 petroleum system events chart 638
 size and numbers of undiscovered fields 638
 West Greenland East Canada Province 637–639
 Canada Sedimentary Basin, Western
 exploratory bias 582
 volumetric method input parameters 583
 Canadian Arctic Archipelago map 546, 569
 Canadian Arctic Islands
 chronostratigraphy 511
 Cretaceous and Cenozoic basins 596
 Cretaceous and Cenozoic strata 603
 formulas for best-fit curve v. depth plots 572
 geology 568
 internal velocities for selected rocks 601
 Canadian Arctic passive margin
 crustal architecture 538–541
 geological and geophysical background 527–531
 observations and interpretations 534–541
 petroleum framework and seismic data 530–531

- Canadian Arctic passive margin (*Continued*)
 petroleum potential 527–541
 regional seismic interpretation of crustal framework 527–541
 seismic profiles 531–538
 Line 3500, Beaufort Foldbelt 532–533
 Line 4250, Amauligak Trough 533
 Line 4550, Rift Transform 533–536
 Line 4675-5000, NE Tuk segment, Amundsen Gulf 536
 Line 4925, Banks Island margin 538
 line 5600, dip to strike to dip 531–532
 Line 5690, Banks Island margin 536–538
 tectonic domains of CAPM 528–530
- Canadian Beaufort Sea
 crustal domains **532**
 crustal units and Moho 534
 dip line 4675 538
 pre-rift reconstruction 541
 seismic grid of surveys 530
 strike line 5000 538
 structural sequence **532**
 tectonostratigraphic chart 529
- Canadian Beaufort shelf 788
- Canning Mackenzie deformed margin
 petroleum potential 519–520
 rifted sediment prisms internal structure 518
- Cape Mamen F-24 well
 organic matter reflectance **573**
 vitrinite **573**
- Caradocian Timan Pechora sedimentary basin 225–226
- Carboniferous
 Arctic North America petroleum systems 454
 Arctic region during Palaeozoic 71–72
 greater Barents Sea 167–168, 168–171
 Kaskaskia III Late Famennian Early Visean 96
 Kaskaskia IV Middle Visean Serpukhovian 96
 Lower Absaroka I Bashkirian Kasimovian 97–100
 Russian Arctic Shelf 350–351
- Carey Basin
 interpreted reflection profiles. *See* Chapter 40 foldout
 rift-related basins 609–610
- Carnian strata 103
 deposits 177
 facies 552
 fluvial channel 257
 Lougheed Island Melville Island 552
 Pat Bay Formation 561–562, 563
 stratigraphic component prospects 551–552
 Upper Absaroka II Norian 103
- Cenomanian
 Upper Zuni II Albian 114
 Upper Zuni III Turonian 114–115
- Cenozoic
 Baffin Bay region 596
 Barents and Kara Seas sedimentary cover 218–220
 Barents plate 218–219
 Canadian Arctic Islands strata 603
 composite petroleum system 631–632
 East Barents Sea Basins and Admiralty Arch 298–299
 greater Barents Sea 168, 182–183
 Lomonosov Ridge microcontinent stratigraphy 760
 Mezenskaya syncline 218
 north and east margins of Siberian Craton 416
 Sverdrup Basin tectono-stratigraphic assemblages 568–569
 western Barents Sea 182
 West Greenland strata 603
- Central Arctic Ocean
 approaches for partitioning 721
 Article 76, 715–716, 718, 720
 bathymetric data 721, 726
 continental shelf preparations 717–719
 continental shelf submission 717
 continental shelf submissions in central Arctic Ocean, Russia
 and Norway 716–717
 energy prospects 725–726
 extending coastal state boundaries 715–729
 gas hydrate prospects 728
 high northern latitudes 710–711
 hydrocarbons quest 715–729
 international frameworks 726–728
 long distances 722
 map 727, 728
 maritime areas beyond 200 nautical miles 718
 operational difficulties 720–725
 ice conditions 723
 logistical challenges 723–724
 operational experiences 724–725
 operational strategies 723
 weather 722
 preliminary assessment of cumulative outer limits 719–720
 resolving overlapping OSCs 720
 ridge and other interpretive issues 719
 sea ice coverage 723
- Central Barents depression 332
 inverted structure 335
- Char field 547
- Chattian Aquitanian 119–120
- Christopher Formation 571
- Chukchi Borderland 720
 geophysical exploration 697
- Chukchi Microcontinent
 aeromagnetic evidence 785
 opening of Amerasia Basin 785–786
 tectonic history 795
- Chukchi Sea
 petroleum geology 385–388
 petroleum provinces 447–448
 sedimentary basins 385–388
 stratigraphic column 331
 tectonic scheme 330
- Chukchi Shelf. *See also* US Chukchi Shelf
 structural elements 386
- Circum-Arctic
 aggregation estimates 160
 base map 50
 bathymetry and topography 40
 colour-shaded relief image 51
 cratons 465, 466
 detrital zircon reference spectra 466
 framework for geodynamic interpretations 49–59
 free-air gravity anomalies 56
 geological map 41
 gridded data **42**
 magnetic anomaly 44–45
 magnetic anomaly map 52
 magnetic data and anomalies 49
 magnetic data sets 42
 magnetic domains 53
 magnetic domains comparison 54
 magnetic interpretation 50–54
 magnetic interpretation map 57
 orogens 465
 Precambrian cratons 463–466
 regional magnetic domain 51
 regional magnetic domains 49–50, 49–59
 resource appraisal **152–153**
 zoned magnetic potential 55
- Circum-Arctic Mapping Project (CAMP) 43
 gravity anomaly 46–47
 gravity anomaly map 42–44
 magnetic and gravity anomaly maps 39–44
 magnetic anomaly map 39–42
 map backgrounds 39
 present day location of main tectonic features 44–47
- Circum-Arctic Resource Appraisal (CARA)
 Arctic mapping 145
 assessment units 155, 157
 geological analysis 145–147
 geological data input form 147
 location of assessment units 666
 methodology 663–671
 assessment units 666–670
 defined but not quantitatively assessed 670
 development 663–671
 Liverpool Land Basin Assessment Unit 669–670
 modelling postulated petroleum systems 665–666
 NE Greenland assessment 663–671
 NE Greenland Volcanic Province Assessment Unit 669
 northern Danmarkshavn Salt Basin Assessment Unit 666–668
 results 670–671
 south Danmarkshavn Salt Basin Assessment Unit 668–669

- subsurface geology of NE Greenland shelf 664–665
- Thetis Basin Assessment Unit 669
- Wandel Sea Basin Assessment Unit 670
- organization and methods 145–149
- provinces discussed by USGS authors 146
- quantitative procedures and geological input form 147–149
- recoverable gas resources 158
- recoverable oil resources 158
- undiscovered AU oil resources 155
- undiscovered AU resources 156
- undiscovered recoverable gas 159
- undiscovered recoverable oil 158
- US Geological Survey 145–149
- Coburg High reflection profiles. *See* Chapter 40 foldout
- Continental Shelf development 716
- Cordilleran terranes 470–473
- Crackerjack and Klondike locations. *See* Chapter 33 foldout
- Cretaceous
 - Arctic North America petroleum systems 457
 - Arctic Region 19
 - Baffin Bay region 596
 - Baffin Fan geological setting 600–602
 - Baffin Fan rifting 615
 - Canada Basin
 - potential source rocks 518–519, 519
 - provenance areas 513
 - rifted margins geology 511–512, 514
 - Canadian Arctic Islands strata 596, 603
 - Christopher Formation thickness 571
 - greater Barents Sea stratigraphic evolution 179–182, 182
 - Lomonosov Ridge strata 762
 - Russian Arctic Shelf lithofacies 351–352
 - Siberian Craton tectono-stratigraphic evolution 415–416
 - strata in Amerasia Basin 762
 - western Barents Sea 182
 - West Greenland strata 603
- Daldynain Toyonian 79–81
- Danian
 - Baffin Fan rifting 615
 - geological setting 600–602
- Danmarkshavn Basin South
 - burial history model 668
 - depth v. risked thermal maturity 668
- Danmarkshavn Salt Basin Assessment Unit 668–669
- De Geerdalen Formation
 - cross bedding 256
 - ripples on bedding plane 257
- De Long High 385
- De Long Massif 374
- Denisov Trough 339
- Denmark's Article 76 field work 715–716, 719
- Devonian
 - Arctic North America petroleum systems 454
 - Arctic region during Palaeozoic 67–68, 68–70
 - Arctic region palaeoreconstruction 70, 71
 - greater Barents Sea 165–167
 - Kaskaskia III Late Famennian Early Visean 96
 - Kaskaskia I Late Pragian Eifelian 93–94
 - palaeogeography and Pechora Sea 240
 - Pechora Sea carbonate reservoir rocks 237–248
 - Russian Arctic Shelf lithofacies 350
 - sinuous fractures 242
 - Timan Pechora Basin sedimentary basin 231
 - Tippecanoe IV Middle Pridolian Middle Pragian 91–92
 - void space structure 243–244
- Diamond well. *See* Chapter 33 foldout
 - seismic line 6100. *See* Chapter 33 foldout
- Domanik Paleozoic Composite Petroleum System 286–287
- Drake D-68 well 577
- Dresbachian 81–84
- Dzhangodskaya petroleum system 143
- Eagle Plain Basin petroleum system 138–139
- East Barents Province
 - assessment ratios **306**
 - co-product ratios, ancillary data and depths **305**
 - map of structural features 296
 - petroleum system elements 297
- East Barents Sea Basin
 - Admiralty Arch assessment unit 306–307
 - assessment results 307
 - compressive structures 191
 - geological analogues for assessment 301–302
 - geology and petroleum potential 295–307
 - Kolguyev Terrace assessment unit 302–304
 - geological analysis of assessment unit probability 302–303
 - number, sizes, and petroleum composition of undiscovered fields 303–304
 - petroleum composition and properties of undiscovered fields 304
 - sizes of undiscovered fields 304
 - Ludlov Saddle assessment unit 304
 - North Barents Basin assessment unit 305–306
 - charge probability 305
 - geological analysis of assessment unit probability 305
 - number, size and petroleum composition of undiscovered fields 305–306
 - rocks probability 305
 - timing and preservation probability 305
 - undiscovered fields sizes 306
 - undiscovered petroleum composition and properties 306
 - Novaya Zemlya Basins 306–307
 - charge probability 307
 - geological analysis of assessment unit probability 307
 - rocks probability 307
 - timing and preservation probability 307
 - petroleum occurrence 295–296
 - petroleum systems 142
 - province boundary definitions 295
 - South Barents Basin assessment unit 304
 - composition of undiscovered fields 304–305
 - geological analysis of assessment unit probability 304
 - properties of undiscovered fields 305
 - sizes of undiscovered fields 305
 - tectono-stratigraphic evolution 296–299
 - Cenozoic 298–299
 - Mesozoic 297–298
 - Palaeozoic 296–297
 - Proterozoic 296
 - total petroleum system 299–301
 - assessment units 301
 - reservoir and seal rocks 300
 - source rocks 299–300
 - traps and timing 300–301
- Eastern Hemisphere
 - petroleum systems 139–143
 - source-reservoir-seal systems 141
- Eastern Klamath basement 475
- East Siberia
 - collision with Kazakhstan 100
 - quadrant. *See* Chapter 2 foldout
- East Siberian continental margin
 - crustal structure 395–410
 - data acquisition 398–401
 - acquisition 398–399
 - procedure and errors 399
 - geophysical exploration 697
 - modelling techniques 398–401
 - modelling uncertainties analysis 408–409
 - previous research on area 395–397
 - geotranssect area morphology and place names 395–397
 - previous geophysical investigations 395–397
 - seismic 396–397
 - refraction seismic data 395–410
 - results and interpretation 402–404, 405
 - comparison with previous interpretations 403–404
 - East Siberian margin 405
 - geotranssect refraction model layers I–IV 403
 - Podvodnikov and Makarov basins 405–407
 - reflection depth section layer I 402–403
- East Siberian Sea Basin 383
 - MCS line 376
 - petroleum geology 380–385
 - SAS sedimentary basins 380–385
- East Siberian Shelf 404
 - geological cross-section 384
 - picking error **409**
 - picking procedure 409
 - structure 382
 - structure map 384
- Edgeøya proximal facies 256

- Ellesmere Island
 aerogravimetric and aeromagnetic data 726
 Middle Triassic strata 551
- Ellesmerian Orogeny 505
 North American Cordillera 468–469
 palaeogeography 477
- Emsian Palaeozoic reef formation 225–226
- Eocene
 Arctic North America petroleum systems 457, 459
 Baffin Fan sequences 610–611
 Canada Basin 318
 convergence in southeastern Canada Basin 795
 Eurasian Arctic regions 313
 Greenland petroleum systems 457
 Lomonosov Ridge strata 762
- Eskimo Lakes Fault Zone 785
- Eurasia Arctic region
 Arctic Uralides 313–315
 Caledonian suture 311–312
 Eocene view 313
 geographic elements 312
 Late Palaeozoic tectonics and Novaya Zemlya 314
 Late Palaeozoic tectonics and Taimyr 314–315
 Mesozoic fold belts, Taimyr and Verkhoyansk 315–316
 Mesozoic tectonics and Taimyr 315–316
 Mesozoic tectonics and Verkhoyansk 316
 Okhotsk Chukka volcano plutonic belt 319–320
 orogens and Arctic tectonics 311–321
 synthesis 315, 316
 tectonic elements 320
 Timanide fragments 312–313
 Western South Anyui Suture 316–319
 boundaries of AACM 318–319
 space problem 316–318
- Eurasia Basin **732**
 Amundsen Basin Assessment Unit 747–748
 charge 747
 rocks 747–748
 timing 748
 assessment units 740–748
 bathymetric map 733
 burial history models 764
 distribution of source rock strata 739
 Eurasia Basin petroleum province definition 731–733
 geological setting 733–735
 geology and petroleum potential 731–749
 geophysical exploration 695
 Lena Prodelta Assessment Unit 741–744
 charge 741–743
 rocks 743
 timing 743–744
 Nansen Basin Assessment Unit 746–747
 charge 746
 rocks 746–747
 timing 747
 Nansen Basin Margin Assessment Unit 744–746
 charge 745
 rocks 745–746
 timing 746
 north tectonic elements 328
 petroleum assessment 748
 petroleum generation 681
 petroleum province definition 731–733
 petroleum systems 738–740
 stratigraphy 735–738
 structural features 734
- Eurasian Region Western
 Mesozoic successions 330
 Palaeozoic successions 329
- Eurekan Structures Assessment Unit
 geological model for assessment 632
 petroleum event chart 635
 West Greenland East Canada Province 632–635
- European Platform reef evolution 226
- European Research Icebreaker 712
- Extended Continental Shelf development 716
- Fiji Basin 55
- Finnmark Platform
 core section 177
- correlation of strata 176
- Early–Middle Jurassic strata 179
- Late Permian spiculite buildup 172
- reservoir development 174
- seismic section 177
- Foredeep Basins Assessment Unit
 composite petroleum system events 291
 estimation of sizes and numbers of undiscovered fields 292
 gas fields numbers 291
 geological analysis of assessment unit probability 291
 undiscovered petroleum accumulations 290
- Franklinian basins 657–658
- Franklinian orogeny 91
- Franklinian sequence 505
 new seismic data 504–505
- Franklinian stratiform section. *See* Chapter 33 foldout
- Franklinian uplift schematic drawing 505
- Franz Josef Land 263. *See also* Northern Barents Basin
- mapping tectonic features 203
- Frasnian
 organic buildups 227
 Timan Pechora sedimentary basin 226
- Gakkel Ridge
 burial history model 741
 spreading centre 695
- Geotransect fields and seismic models 400
- Gidrografov morphological characteristics **268**
- Givetian Famennian 94–96
- Glacier Basin 609
 interpreted reflection profiles. *See* Chapter 40 foldout
- Glacier High
 interpreted reflection profiles. *See* Chapter 40 foldout
- Gondwana
 break-up 108
 collision with Laurussia 96
- Gramberg's conception of oceans' staged development 443–444
- Greater Barents Sea
 bathymetry map 164
 Cenozoic depth structure map 168
 chronostratigraphy and facies 169
 generated hydrocarbon volumes 188
 magnetic field 167
 magnitude of uplift **275**
 net erosion 275, 278
 palaeoenvironment and lithofacies 170
 Permian depth-structure map 167
 petroleum provinces with Cenozoic uplift **274**
 petroleum systems 183–190, 187
 hydrocarbon distribution 185–187
 source rocks maturation and timing of petroleum generation
 184–185
 source rocks presence 183–184
 volumetric potentials 187–190
 petroleum systems implications 163–192
 play models and exploration potential 191–192
 porosity v. depth plot 279
 regional profiles 166
 significant petroleum source rocks **184**
 sill intrusions effect 279
 structural elements 165
 tectonic and stratigraphic evolution 163–183
 Carboniferous 167–168
 Cenozoic 182–183
 Early Late Triassic 173–176
 geological setting 163–165
 Late Carboniferous Early Permian 168–171
 Late Cretaceous 182
 Late Jurassic Early Cretaceous 179–182
 Late Permian 171–173
 Late Triassic Middle Jurassic 176–179
 Ordovician Devonian 165–167
 tectonic movement and erosion 280
 tectonostratigraphy 163–192
 uplift and erosion 273, 276, **276**
- Greater Ungava Fault Assessment Zone
 petroleum system events chart 642
 West Greenland East Canada Province 640–642
 co-product ratios and ancillary data 642
 geological model for assessment 640–641

- Great Siberian block 65
- Greenland. *See also* West Greenland East Canada Province
aerogravimetric and aeromagnetic data 726
Canadian margins boundaries 755–757
data density 452
east
breakthroughs with impact on industry **657**
outcrops 656
genetic evolution 451–460
geodynamic timing chart 453
implications for petroleum systems 451–460
map 648
Northeast
Circum-Arctic Resource Appraisal methodology 663–671
exploration targets 657
petroleum prospectivity **658**
stratigraphy and lithology 667
tectonic elements 664
offshore SE petroleum exploration 658
petroleum systems 453–457
quadrant. *See* Chapter 2 foldout
tectonic framework 451–453
West
Cretaceous and Cenozoic strata 603
exploration activities 652, 654
exploration history 648–651
licensing history 650–651
outcrops 653
petroleum prospectivity **655**
- Greenland petroleum exploration
administration and strategy 647–648
ARCO exploration in Jameson Land 655
east exploration 653–656
exploration in 1970s off SW Greenland 649
future challenges 647–659
future challenges in east 656–657
future challenges in west 651–653
geological setting of sedimentary basins 648
Kanumas project 649, 655
Labrador Sea 658
Lincoln Sea Basin 658
Lomonosov Ridge 658
millennium seismic industry, EnCana, Disko West 649–651
offshore exploration Fylla 649
offshore SE Greenland 658
offshore Wandel Sea Basin 658
onshore exploration in 1990s Disko and Nuussuaq 649
onshore Franklinian and Wandel Sea basins 657–658
other regions in Greenland, history and future challenges 657–658
petroleum assessments by USGS 656
petroleum research by GEUS 651–652
petroleum research by others 656
Sisimiut West 649
west Greenland exploration history 648–651
- Greenland Rifted Margin Assessment Unit
geological model for assessment 635
petroleum system events 637
seismic profile 635
timing and preservation probability 636–637
West Greenland East Canada Province 635–637
- Greenland shelf cross-section 665
- Greenland Volcanic Province Assessment Unit 669
- GRZ-Nanushuk petroleum systems 138
- Gydan Yuratskiy region
basement 354–355
geological model and oil and gas potential 353–357
integrated geological and geophysical section 355
methodology 353
rifts and uplifts 357
sedimentary section 353–354
seismic profiles 355
structural and tectonic map 354
- Gzhelian Asselian 100
- Hammerfest Basin isotopic characteristics 188
- Hanna Trough seismic data 503–504
- Havert Formation Well 7226/11-1 175
- Hazen F-54 well
Middle Triassic strata 551
vitrinite 571
- Heiberg Formation
basin wide cross section 553
Sverdrup Basin 553
- Helicopter J-12 well
depth and gas wetness 578
- Hettangian
Sverdrup Basin facies 554
Upper Absaroka III Pliensbachian 103
Upper Absaroka II Norian 103
- High-latitude Norwegian Greenland Sea
historic ice margins 708
palaeoenvironmental interpretation 707
plate tectonic evolution 706
reflector sequence 707
site location, drilled depth **705**
- High northern latitudes
Arctic North Atlantic Gateways 708–710
Borehole Observatory 711
first drilling in Central Arctic Ocean 710–711
future 711–712
scientific breakthroughs at Vøring Plateau 706–708
scientific deep-sea drilling 703–713
testing regional evolution 704–706
- Hopen 253
Carnian fluvial channel 257
coal seam and roots 257
- Hopen High 190
- Hovercraft 694
research platform alternatives 693
- Hue Shale petroleum systems 138
- Husky Goodenough Parsons Group
petroleum systems 139
- Hydrocarbon column components **434**
- Hydrocarbon potential
Arctic Region 17, **18**, 22
Baffin Fan of Arctic eastern Canada 619–621
Barents and Kara Seas 342
central Arctic Ocean 715–729
Eurasian shelf of Russian seas 445–448
petroleum provinces of Barents Kara Platform 445
Russian Arctic **439**
Russian Arctic Ocean Shelf 443–448
Russian Arctic Shelf of Barents Sea 346
Sverdrup Basin, Arctic Canada 567–579
Timan Pechora sedimentary basin 230–233
- Hydrocarbon systems
Barents Kara region 438
offshore Russian Arctic basins 433
Pechora Shelf **436**
Timan Pechora Basin sedimentary basin **233**
- Ice drift stations 688–690
- Iceland Reykjanes Ridge 775
- Indian Early Norian 173–176
- Induan Lower Carnian 103
- Izhma depression assessment unit
geological analysis of assessment unit probability 288
Timan Pechora Basin Province, Russia 287–288
- Izhma Pechora depression 338
- Jameson Bay **572**
- Jones Sound Basin
interpreted reflection profiles. *See* Chapter 40 foldout
rift-related basins 609
- Jurassic
Amerasia Basin strata 760–762
Arctic North America petroleum systems 454–457, 456, 458
Bjarmeland Platform stratigraphy and facies 180
Finnmark Platform strata 179
greater Barents Sea 176–182
Lomonosov Ridge source rocks 760–762
Northern Barents Basin deposits 267
South Barents Basin 180
Sverdrup Basin 548
Sverdrup Basin, Canadian Arctic Archipelago 545–557
zircon geochronology of northwestern Axel Heiberg Island 559–565
- Kanumas project 655
- Kara petroleum region 445–446
- Kara Sea. *See also* Barents Kara region
aeromagnetic surveys 200

- Kara Sea (*Continued*)
 depth model according to geophysical survey results 209–221
 depth-to-basement 205
 geological and geophysical section 356
 gravity and magnetic data 198–201, 207
 gravity and magnetic data interpretation 201–206
 gravity anomaly 200
 gravity anomaly map 201
 gravity measurements 199
 hydrocarbon generation and migration 342
 integration of survey results 212–213
 magnetic anomaly map 202
 Moho depth 206
 palaeogeographic history 197–198
 Palaeozoic to Cenozoic sedimentary cover 218–220
 plate boundaries 198
 recorded wavefields 211
 relief 198
 Russian Arctic Shelf resources 348
 structural interpretation 197–207, 203
 techniques 209–212
 tectonic elements 327
 tectono-stratigraphic crustal units 213–218
- Kara Shelf
 Arctic extensional basins 325–330
 continental rift system 356
 geological evolution and hydrocarbon potential 325–343
 Mesozoic source rocks 341
 oil and gas potential 339–341
 southern part
 basement 354–355
 geological model and oil and gas potential 353–357
 methodology 353
 rifts and uplifts 357
 sedimentary section 353–354
 structural elements 331–339, 336–338
- Kara syncline
 North 220
 South 219–220
- Kara Trough South 337
- Karlsen Trough 263. *See also* Northern Barents Basin
- Kaskaskia I Emsian
 global plate tectonic map 93
 palaeoenvironment and lithofacies 93
- Kaskaskia I Frasnian
 global plate tectonic map 95
 palaeoenvironment and lithofacies 95
- Kaskaskia I Late Pragian Eifelian 93–94
- Kaskaskia I Tournaisian
 global plate tectonic map 97
 palaeoenvironment and lithofacies 97
- Kaskaskia I Viséan
 global plate tectonic map 98
 palaeoenvironment and lithofacies 98
- Kaskaskia II Middle Late Devonian 94–96
- Kaskaskia III Late Famennian Early Viséan 96
- Kaskaskia IV Middle Viséan Serpukhovian 96
- Kazakhstan and East Siberia collision 100
- Khatanga Saddle
 densities, input distributions and assessment 425
 geological analogues for assessment 426–427
 north and east margins of Siberian Craton 427
- Khatanga Saddle Assessment Unit
 north and east margins of Siberian Craton 420, 426–427
 Yenisey Khatanga Basin Province 420
- Khoreyver Depression sequence 234
- Khoreyver well thermal maturity model 230
- Kimmeridgian facies 556
- Klamath basement 475
- Klondike location. *See* Chapter 33 foldout
- Kola Monocline 331
 seismic-geological model 331
- Kolguevskaya Monocline 338
- Kolgueyev Terrace Assessment Unit
 distributions and assessment 303
 East Barents Sea Basins and Admiralty Arch 302–304
 geological analogues for number of undiscovered fields 301
 geological analogues for undiscovered fields sizes 302
 geological analysis of assessment unit probability 302–303
 number, sizes, and petroleum composition of undiscovered fields 303–304
 sizes of undiscovered fields 304
- Kolva Swell 339
- Kong Karls Land seismic profile 253
- Kvalpynten fault 259
- Laboganskoye Field 246
- Labrador Sea
 internal velocities for selected rocks 601
 petroleum exploration 658
- Ladinian
 environmental conditions 259
 sandstone Middle Triassic strata 551
 tidal channel complex 255
- Lady Ann Basin
 interpreted reflection profiles. *See* Chapter 40 foldout
 rift-related basins 608–609
- Lancaster Sound region
 geological history 614
 northern interpreted reflection profiles. *See* Chapter 40 foldout
 reflection profiles. *See* Chapter 40 foldout
 refraction profiles and velocity profiles 607
 rift-related basins 606–608
- Laptev Ridge northslope 695
- Laptev Rift System structure 378
- Laptev Sea Shelf
 AVO analysis application to seismic records 359–367
 AVO anomaly 364
 continental margin geophysical exploration 695
 data base map 360
 direct hydrocarbon indicators 361–367
 AVO classification of gas-bearing sands using partial stacks 363–364
 classification of gas-bearing sands using AVO seismograms 362–363
 identification of gas-bearing sands in AVO attribute stacks 364–367
 seismic record anomalies 362
 geological structure 359
 location 360
 petroleum region 447
 plate tectonic events 279
 SAS sedimentary basins and petroleum geology 377–380
 seismostratigraphic complexes 359–361
 stratification of reflectors 361
 structural elements 361
 uplifts 363
- Laurentia
 Circum-Arctic Precambrian cratons 464
 continental crust 531
 palaeogeography and development 476
 western palaeogeography and development 476
- Laurussia
 collision with Gondwana 96
 formation 100
- Lekkeyaginskoye Field
 carbonate reservoirs 239–241
 rocks characterized 240
- Lena Anabar Basin
 burial history 421
 densities, input distributions and assessment 425
 geological analogues for assessment 426–427
 lithostratigraphic column and total petroleum system events 421
 north and east margins of Siberian Craton 420–422
 regional geological cross section 416
- Lena Anabar Basin Assessment Unit
 north and east margins of Siberian Craton 422, 427
- Lena Anabar Basin Updip Assessment Unit 422
- Lena Prodelta
 seismic interpretation of strike line 736
 systems treatment 27
- Lena Prodelta Assessment Unit
 Eurasia Basin 741–744
 charge 741–743
 rocks 743
 timing 743–744
- Lena Vilyui Basin Province
 burial history diagrams 424
 lithostratigraphic column and total petroleum system 423
 north and east margins of Siberian Craton 422–424
 Northern Priverkhoyansk Foredeep Assessment Unit 424
 source rocks 422–423

- Lincoln Sea
 geological provinces adjacent 674
 magnetic anomaly map 682
 palaeowater depth 679
 petroleum generation 680
 stratigraphies in modelled pseudowells 679
 trough ice drainage 725
- Lincoln Sea Basin
 burial history and petroleum generation modelling 679–680
 and content 675–677
 crustal velocity model 676
 geological model 677
 geology and petroleum potential 673–682
 geology overview 673–674
 history and future challenges 658
 Lincoln Sea Basin and content 675–677
 major faults adjacent 677
 petroleum exploration 658
 resource assessment petroleum systems elements 678–679
 stratigraphy 674–675
- Lisburne Barrow petroleum systems 138
- Liverpool Land Basin Assessment Unit 669–670
- Lomonosov Ridge 727, 737
 burial history models 762–764, 763
 Cenozoic stratigraphy from scientific drilling 760
 Circum-Arctic maps 753
 geological framework from regional geology of conjugate margin 757–758
 geophysical exploration 697–698
 ice-rafting 709
 map 756
 microcontinent boundaries 753–757
 Paleocene and Eocene strata 762
 petroleum exploration 658
 petroleum geology 751–766
 petroleum prospectivity 765–766
 post-rift strata in Amerasia Basin 762
 reservoirs, traps, and seals 764–765
 seismic data architecture 758–760
 seismic reflection profile 759
 seismic section 697
 Siberian and Greenland Canadian margins boundaries 755–757
 source rocks 760–762, 761
 stratigraphy 757–760
 stratigraphy and lithology 759
 synrift strata in Amerasia Basin 760–762
 tectonic evolution of central Arctic region 751–753
 Triassic and Jurassic platform strata 760
- Loppa High
 eastern seismic section 174
 geochemical and isotopic characteristics 188
 geological development 171
- Lorita 1 profile
 crustal velocity 676
 refraction seismic experiment 724
- Lost Hammer Diapir 556
- Lougheed Island
 Carnian stratigraphy 552
 Oxfordian Kimmeridgian third-order sequence 556
- Lower Absaroka I Bashkirian Kasimovian 97–100
- Lower Absaroka I Moscovian
 global plate tectonic map 99
 palaeoenvironment and lithofacies 99
- Lower Absaroka II/III Asselian 100
 global plate tectonic map 101
 palaeoenvironment and lithofacies 101
- Lower Absaroka II/III Guadalupian
 global plate tectonic map 102
 palaeoenvironment and lithofacies 102
- Lower Absaroka IV Guadalupian 100–102
- Lower Zuni I, Bajocian
 global plate tectonic map 107
 palaeoenvironment and lithofacies 107
- Lower Zuni I Bajocian/Bathonian 103–107
- Lower Zuni II, Kimmeridgian
 global plate tectonic map 109
 palaeoenvironment and lithofacies 109
- Lower Zuni III Berriasian 108
 global plate tectonic 110
 palaeoenvironment and lithofacies 110
- Ludlov Saddle 298
 distributions and assessment 303
- Ludlov Saddle Assessment Unit 298
 East Barents Sea Basins and Admiralty Arch 304
 number, sizes and petroleum composition of undiscovered fields 304–305
 petroleum composition and properties of undiscovered fields 305
 geological analogues for sizes of undiscovered fields sizes 303
 geological analogues for undiscovered fields sizes 302
- Lutetian 117–118
 Bartonian 117–118
 palaeoenvironment and lithofacies 116
- Mackenzie Delta 533
 chronostratigraphy 511
 first-order chronostratigraphy 788
 petroleum systems 139
 systems treatment 27
- Main Basin Platform Assessment Unit
 composite petroleum system 289
 co-product ratios and ancillary data 290
 numbers of undiscovered oil and gas fields 289
 oil and gas fields numbers 290
 undiscovered petroleum accumulation 288
- Makarov Basin 397
 crustal structure 395–410
 data acquisition and modelling techniques 398–401
 margin geophysical exploration 697–698
 modelling uncertainties analysis 408–409
 previous research on area 395–397
 reflection seismic data 406
 refraction seismic data 395–410
 results and interpretation 402–404, 405
 seismograms and ray tracing 402
 shot files 692
- Makinson Inlet 597
- Malozemelsko Kolguevskaya Monocline 338
- Malyshevskaya petroleum systems 143
- Marie Bay shoreface sandstone 556
- Marresalinskaya petroleum systems 143
- Medyn Swell 339
- Melville Island
 Carnian stratigraphy 552
 Middle Triassic strata 551
- Mendelev Ridge 775
 geophysical exploration 698
 P-wave velocity models 404
 seismic section 697
 seismograms and ray tracing 402
- Mesoproterozoic basin
 development and structure of Baffin Fan 613
 interpreted reflection profiles. *See* Chapter 40 foldout
- Mesozoic
 Arctic tectonics fold belts 315–316
 Barents Kara Shelf source rocks 341
 composite petroleum system 631–632
 Eurasian orogens fold belts 315–316
 Sverdrup Basin strata 548
 Sverdrup Basin stratigraphic succession 585
 tectono-stratigraphic evolution 297–298
 Verkhoyansk fold belts 316
 Western Eurasian successions 330
- Mezenskaya syncline 218
- Miocene
 Baffin Fan of Arctic eastern Canada 618
 Baffin Fan sequence 611
 convergence in southeastern Canada Basin 795
- Mississippian Arctic region 70–71, 72
- Monte Carlo simulation run 275
- Moreyusskaya depression 339
- Morris Jesup geophysical exploration 695–696
- Mount Goodenough Parsons Group 139
- Nansen Basin
 burial history model 743
 geophysical exploration 695
- Nansen Basin Assessment Unit 746–747
 charge 746
 rocks 746–747
 timing 747

- Nansen Basin Margin
 burial history model 742
 seismic data and interpretation 735
- Nansen Basin Margin Assessment Unit 744–746
 charge 745
 rocks 745–746
 timing 746
- Natural gases 435
- Naulskoye Field 246
- Neoproterozoic
 Circum-Arctic region 466–470
 North American Cordillera rocks 471
 and orogenic events 472
 Timanides 466–467
- New Siberian Basin 381
- New Siberian Chukchi Fold 374
- New Siberian Rift seismic fragment 383
- Nonprospective terranes. *See* Chapter 2 foldout
- Nordkapp Basin 179
 correlation of strata 176
 geoseismic section 336
- Norian sequence 254
 Sverdrup Basin 552–553
 Sverdrup Basin strata 552
- North American Cordillera 464
 Circum-Arctic Precambrian cratons 463–466
 Laurentia 464
 Early Palaeozoic Circum-Arctic homelands 473–475
 exotic terranes 463–479
 Neoproterozoic Palaeozoic orogens 466–470
 Pearya and Ellesmerian Orogen 468–469
 Timanides 466–467
 palaeogeographical setting 474
 palaeogeography 478
 Palaeozoic NW Passage 475–479
 terranes with Timanian, Caledonian and Uralian affinities 470–473
 detrital zircons and basement ages 470–471
 detrital zircon signatures 472–473
 Early Palaeozoic oceanic and arc assemblages 471
 Early Palaeozoic stratigraphy 471
 faunal affinities 471
 faunal and palaeomagnetic evidence 473
 Middle and Late Palaeozoic orogenic events 472
 Neoproterozoic and Early Palaeozoic arc and orogenic events 472
 Neoproterozoic–Cambrian rocks 471
- North Barents Basin Assessment Unit
 Admiralty Arch 305–306
 distributions and assessment 303
 East Barents Sea Basins 305–306
 geological analogues 302, 303
 geological analysis of assessment unit probability 305
 petroleum system model 300
 undiscovered fields sizes 302, 303
- North Barents Trough geological profile 336
- North Chukchi Basin
 seismic data 503
 two-way time fragment 387
- North Danmarkshavn Salt Basin Assessment Unit (NDSB) 147–148
 Circum-Arctic Resource Appraisal methodology 666–668
- Northern Barents Basin 261–269, 266
 continental palaeomargin 264
 geological section 262
 geological structure 261–267
 isopachs maps 263
 Jurassic deposits 267
 petroleum objects 268
 petroleum potential 267–269
 seismic anomalies 265
 seismic grid 262
 tectonic zones 263
- Northern Barents Sea
 calibration of seismic sequences 255
 data base 249
 data coverage 250
 environmental conditions 259
 environmental model 259
 gravimetric Bouguer anomaly map 252
 interpreted regional seismic line 251
 outcrop expressions of seismic sequence boundaries 255–257
 Palaeoocurrent measurements 257–259
 structural framework 249–252
 Triassic clinofolds 252–255
 geometry 252–255
 stacking 255
 Triassic deltaic sequences 249–260
 Triassic sequences 251
- Northern Barents Syncline 261, 263, 265. *See also* Northern Barents Basin
- Northern Depression 263. *See also* Northern Barents Basin
- Northern Hemisphere climate development 711
- Northern Interior Platform petroleum systems 139
- Northern Priverkhoyansk Foredeep Assessment Unit
 densities, input distributions and assessment 425
 geological analogues for assessment 426–427
 Khatanga Saddle Assessment Unit 426–427
 Lena-Anabar Basin Assessment Unit 427
 Lena Vilyui Basin Province 424
 north and east margins of Siberian Craton 427–428
- Northern Sea 475
- North Pacific accretionary collage (NPAC) 6
- North Sabine H-49 well burial history 575
- North Slope of Alaska
 map 502
- North Water Basin
 interpreted reflection profiles. *See* Chapter 40 foldout
 rift-related basins 610
- Northwestern seas of Russia 436–439
- Northwind Basin
 creation by Late Paleocene 795
 formation by crustal extension 793
- Northwind Escarpment aeromagnetic domain 781–782
- Northwind Ridge
 crustal gravity 780
 eastern half. *See* Chapter 50 foldout
 first-order chronostratigraphy 788
- Norwegian Arctic Ocean 716–717
 bathymetry 704
- Norwegian Barents Sea 188
- Norwegian Greenland Sea bathymetry 704
- Norwegian mainland mapping tectonic features 204
- Norwegian Petroleum Directorate (NPD) 249
- Norwegian Russian Arctic areas 326
- Norwegian Sea discoveries 11
- Novaya Zemlya 267
 Arctic Uralides 314
 Barents and Kara Seas mapping 203–204
 Eurasian orogens and Arctic tectonics 314
- Novaya Zemlya Basins 295–307
 assessment ratios 306
 co-product ratios, ancillary data and depths 305
 East Barents Sea Basins and Admiralty Arch 306–307
 geological analysis of assessment unit probability 307
 map of structural features 296
- Novosibirsk Chukchi petroleum provinces 447–448
- ODP well 645E
 stratigraphy 604
- Okhotsk Chukka volcano plutonic belt 319–320
- Olenek Fold Zone 373
- Oligocene
 Baffin Fan sequence 611, 618
- Ordovician 84–87
 arc 474
 Arctic Region 18
 Arctic region during Palaeozoic 67–68
 greater Barents Sea 165–167
 Sauk III Franconian Tremadocian 84
 Tippecanoe I Darriwilian Ashgillian 87
- Orlovskoe morphological characteristics 268
- Oxfordian Kimmeridgian third-order sequence
 Loughheed Island area 556
- Oxfordian Valanginian second-order sequence
 Axel Heiberg 556
 Lost Hammer Diapir 556
 stratigraphic component prospects 554–557
- Palaeogene potential source rocks 519
- Palaeoproterozoic granitoid gneiss complex 597
- Palaeoreconstruction of Arctic region
 Middle Mississippian 72

- Middle Pennsylvanian 73
 Palaeozoic 66, 67, 74
 Palaeozoic
 arc events 472
 Arctic North America petroleum systems 454
 Arctic Region 65–67, 68–69, 74
 Arctic Region terrane 66
 Barents and Kara Seas 216–220
 Barents plate 218–219
 Circum-Arctic homelands 473–475
 Eurasian orogens and Arctic tectonics 314–315
 Mezenskaya syncline 218
 NE European Platform reef evolution 226
 North American Cordillera stratigraphy 471
 oceanic and arc assemblages 471
 orogenic events 472
 orogens of Circum-Arctic region 466–470
 palaeo-positions 62–65
 Sverdrup Basin 568–569
 tectono-stratigraphic evolution 296–297
 Timan Pechora reef formation 227–228
 Timan Pechora sedimentary basin 223–235
 Paleocene
 Arctic North America petroleum systems 457, 459
 Lomonosov Ridge strata 762
 Palnikshor well thermal maturity model 229
 Payhoi Novaya Zemlya Archipelago 338
 Pearya Orogen 468–469
 Pechora Sea
 Devonian carbonate reservoir rocks 237–248
 Early Permian time palaeogeography 245
 geological structure 237–239
 Laboganskoye Field 246
 Lekkeyaginskoye Field 239–241
 Lower Devonian carbonate reservoirs 239–244
 Lower Permian carbonate reservoirs 244–246
 Naulskoye Field 246
 onshore and offshore areas 237–248
 palaeogeography and Early Devonian time 240
 Pechora Sea carbonate reservoir discoveries 246–247
 recorded wavefields 211
 resources 346–348
 Sedyaginskoye Field 245–246
 Severo Saremboyskoye Field 241–244
 structural and tectonic elements 238
 studying fractured and vuggy carbonate reservoirs 239
 Pechora Shelf hydrocarbon systems 436
 Pechora Syncline
 Palaeozoic source rocks 339
 structural elements 338–339
 Pennsylvanian Arctic region 70–71, 73
 Permian
 Arctic region during Palaeozoic 72–73
 Finnmark Platform spiculite buildup 172
 greater Barents Sea 171–173
 Laboganskoye Field 246
 maturity modelling 186
 north and east margins of Siberian Craton 415
 Palaeogeographic map 349
 Pechora Sea carbonate reservoir rocks 237–248
 Pechora Sea carbonate reservoirs 244–246
 Pechora Sea time palaeogeography 245
 porous-fractured reservoirs 246, 247
 reservoir potential 172
 Russian Arctic Shelf of Barents Sea 350–351
 Timan Pechora sedimentary basin 226–227
 void space structure 246
 Petroleum potential
 Admiralty Arch 295–296
 analogues used in assessment 681–682
 Arctic 12
 Arctic Alaska 495
 Canada Basin 519–522
 East Barents Sea Basins 295–296
 field size distribution maximum field size oil-to-gas ration 682
 geological analysis of assessment unit probability 680–681
 charge 680–681
 rocks 681
 timing and preservation 681
 ice conditions 682
 Lomonosov Ridge microcontinent 765–766
 northern Barents Basin 267–269
 number of fields 681–682
 Russian Arctic Ocean Shelf 448
 Sverdrup Basin, Canadian Arctic Archipelago 546–547
 Petroleum provinces of Russian Arctic Shelf 444
 Petroleum system
 Admiralty Arch 299–300
 Arctic 13
 Arctic Alaska 490, 493
 Arctic basins
 Eastern Hemisphere 139–143
 Barents Sea Platform 142
 Dzhangodskaya–Malyshevskaya 143
 East Barents Sea Basin 142
 Lena Anabar Basin 142–143
 Tanopchinskaya–Marresalinskaya 143
 Timan Pechora Basin 143
 Trondelag Platform 139
 Vestspitsbergen Trough 142
 West Barents Shelf Edge 142
 Western Siberia Basin 143
 Yanovstanskaya 143
 Yenisey Khatanga Basin 143
 Western Hemisphere 137–139
 Arctic Fold Belt 138
 Boundary Creek Smoking Hills Taglu 139
 Brooks Range Province 138
 Eagle Plain Basin 138–139
 GRZ-Nanushuk 138
 Husky/Mount Goodenough Parsons Group 139
 Lisburne Barrow 138
 Mackenzie Delta 139
 Northern Interior Platform 139
 Shublik/Hue Shale 138
 Sverdrup Basin 139
 Arctic North America 455, 456, 458, 459
 Early Jurassic petroleum systems 454
 Late Jurassic petroleum systems 454–457
 Baffin Bay Assessment Unit 640
 discovered in Arctic 10–11
 East Barents Basin Province 297
 East Barents Sea Basins 299–300
 Eastern Arctic Seas 440
 forecasting oil and gas fields 433–434
 Greenland 454–457
 Norwegian Sea discoveries 11
 NW Greenland Rifted Margin Assessment Unit 637
 offshore Russian Arctic basins 433–441
 oldest in Arctic 10
 Sverdrup Basin petroleum resources 583–585
 Timan Pechora sedimentary basin 228–235
 West Greenland East Canada Province 631
 Phanerozoic burial and thermal episodes
 geological history 567
 Sverdrup Basin, Arctic Canada 567–569
 Upper Palaeozoic to Cenozoic tectono-stratigraphic assemblages
 568–569
 Phanerozoic palaeoenvironment 79–121
 Phanerozoic time table 80
 Philpots Ridge reflection profiles. *See* Chapter 40 foldout
 Pleistocene Baffin Fan sequences 611–612
 Pliensbachian Aalenian sequence
 stratigraphic component prospects 553–554
 Sverdrup Basin 555
 Pliensbachian Heiberg Formation 563–564
 results 562
 Pliocene Baffin Fan sequences 611–612
 Plio-Pleistocene glaciomarine deposits 618–619
 Podvodnikov Basin 397
 crustal structure 395–410
 data acquisition and modelling techniques 398–401
 modelling uncertainties analysis 408–409
 previous research on area 395–397
 refraction seismic data 395–410
 results and interpretation 402–404
 seismograms and ray tracing 401
 Polousnyi Turbidite Terrane 374
 Popcorn locations. *See* Chapter 33 foldout
 Pospelov High 263. *See also* Northern Barents Basin

- Precambrian cratons 463–466
- Pre-Novaya Zemlya 261, 263, 265. *See also* Northern Barents Basin
- Priabonian Rupelian 118–119
- Priverkhoyansk Foredeep 416
- Progradational sedimentary succession 27
- Proterozoic
- Barents and Kara Seas crustal units 216–218
 - East Barents Sea Basins and Admiralty Arch 296
 - north and east margins of Siberian Craton 413–415
- Rhaetian Sinemurian sequence 554
- stratigraphic component prospects 553
- Rift Transform seismic profiles 533–536
- Roadian Changhsingian 100–102
- Roche Point Formation thermal maturity 574
- Rupelian 118–119
- palaeoenvironment and lithofacies 117
- Russian Arctic basins
- Arctic Ocean 716–717
 - initial hydrocarbon resources **439**
 - offshore 433–441
 - Eastern Arctic Sea 439–441
 - forecasting giant gas fields 434–435
 - northwestern seas of Russia 436–439
 - petroleum systems and forecasting oil and gas fields 433–434
 - petroleum systems and multiple hydrocarbon systems 433
 - Timan Pechora Province 435–436
- Russian Arctic Ocean Shelf
- Eastern Arctic 447–448
 - hydrocarbon resources 445–448
 - initial theoretical position 443–444
 - Laptev petroleum region 447
 - Novosibirsk Chukchi petroleum provinces 447–448
 - palaeogeographic map 348, 350
 - petroleum provinces 444
 - petroleum provinces of Barents Kara Platform 445
 - petroleum resources development 448
 - potential for hydrocarbon resource development 443–448
 - resource assessment methodology 444–445
 - role of hydrocarbon resources 448
 - sedimentary cover 347
 - South Kara petroleum region 445–446
 - wells, fields, and seismic lines 346
 - Western Siberian petroleum province 445–446
- Russian Arctic Shelf of Barents Sea
- hydrocarbon resources 346
 - lithofacies and palaeogeographic mapping 349–352
 - Carboniferous Permian 350–351
 - Devonian 350
 - Triassic Cretaceous 351–352
 - oil and gas potential 345–352
 - palaeogeographical mapping 345–352
 - resources 346–349
 - Barents Sea 348
 - Eastern Arctic Shelf 348–349
 - Kara Sea 348
 - Pechora Sea 346–348
- Russian Continental Shelf 345
- Russian Eurasian continental margin **445, 446**
- Russian mainland mapping tectonic features 204
- Russian nuclear icebreaker 727
- Russian sector Chukchi Sea 385–388
- Sabine H-49 well
- burial history model 575
- Sakmarian palaeogeographic map 349
- Salmskoe morphological characteristics of uplifts **268**
- Sauk I Early Cambrian
- global plate tectonic map 81
- Sauk I Nemakit 79–81
- Sauk II Arenigian
- global plate tectonic map 86
 - palaeoenvironment and lithofacies 86
- Sauk II Middle Cambrian
- global plate tectonic map 83
 - palaeoenvironment and lithofacies 83
- Sauk II Middle Cambrian Dresbachian 81–84
- Sauk II Tremadocian
- global plate tectonic map 85
 - palaeoenvironment and lithofacies 85
- Sauk III Franconian Tremadocian (Latest Cambrian–Early Ordovician) 84
- Sauk IV late Early–early Middle Ordovician 84–87
- Science missions track lines 693
- Scythian platform 91
- Sedov Trough 263. *See also* Northern Barents Basin
- Sedyaginskoye Field 245–246
- Selandian of Baffin Fan 602–603
- Sentralbanken High 255
- Severo Saremboskoye Field 241–244
- reservoirs 241, 242
- Shapkin Yurjakha Swell 339
- Shublik Shale petroleum systems 138
- Siberia
- affinities in Alaska 471
 - Circum-Arctic Precambrian cratons 465–466
 - margins boundaries 755–757
 - margin seismograms and ray tracing 401
 - palaeocontinent 81
 - palaeogeography and development 476
 - terrane palaeogeography 478
 - Western
 - continental rift system 356
 - depth map 446
 - extensional depression 337
 - hydrocarbon resources 445–446
 - petroleum systems 143
 - seismic profiles 447
 - seismic-stratigraphic section of northern flank 337
 - seismic-stratigraphic section of western flank 337
- Siberian Arctic offshore sedimentary basins 369–390
- impact on petroleum systems 388–389
 - location of compression deformational fronts 388–389
 - petroleum geology with risks related to unconstrained source 389–390
 - regional and petroleum geology questions 388–390
 - sedimentary basins and petroleum geology 376–388
 - Chukchi Sea 385–388
 - East Siberian Sea 380–385
 - Laptev Sea 377–380
 - petroleum geology 379–380
 - structure and age 372–376
 - tectonic setting 370–372
 - uncertainties in stratigraphic correlation of seismic units 389
- Siberian Arctic Shelf
- crustal structural domains 373
 - lithostratigraphy 381
 - physiographic features 370
 - sedimentary basins 377
 - structural occurrence 388
- Siberian Craton 9
- assessment results **428**
 - assessment units and locations 414
 - geological provinces and oil and gas field location 414
 - north and east margins
 - assessment results 429
 - geological analogues for assessment 424–429
 - Khatanga Saddle Assessment Unit 426–427
 - Lena–Anabar Basin Assessment Unit 427
 - Northern Priverkhoyansk Foredeep Assessment Unit 427–428
 - Tunguska Basin Assessment Unit 429
 - Yenisey Khatanga Basin Assessment Unit 428–429
 - geological provinces 413
 - geology and petroleum potential 413–429
 - Lena–Anabar Basin Province 420–422
 - Lena–Anabar Basin Assessment Unit 422
 - Lena–Anabar Basin Updip Assessment Unit 422
 - reservoir and seal rocks 422
 - source rocks 420–422
 - Sukhan–Motorchun Assessment Unit 422
 - traps and timing 422
 - Lena Vilyui Basin Province 422–424
 - Northern Priverkhoyansk Foredeep Assessment Unit 424
 - reservoir and seal rocks 423
 - source rocks 422–423
 - traps and timing 423–424
 - present-day structure 416
 - petroleum occurrence geological models 416–417
 - reservoir and seal rocks 418
 - source rocks 417–418
 - traps and timing 418

- Tunguska Basin Assessment Unit 418
- tectono-stratigraphic evolution 413–416
 - Cenozoic 416
 - Early Proterozoic 414–415
 - Late Proterozoic 415
 - Middle Proterozoic 415
 - Middle Triassic to Cretaceous 415–416
 - Proterozoic 413–414
- Yenisey Khatanga Basin Province 418–420
 - Khatanga Saddle Assessment Unit 420
 - reservoir and Seal Rocks 418–420
 - source rocks 418
 - traps and timing 420
 - Yenisey Khatanga Basin Assessment Unit 420
- Sierra City melange 475
- Silurian
 - arc 474
 - Arctic Region 18
 - Baffin Fan 613
 - Baffin Fan succession 613–615
 - size and amplitude of structure 240
 - Tippecanoe II Llandoveryan 87–89
 - Tippecanoe III Wenlockian Middle Pridolian 90–91
 - Tippecanoe IV Middle Pridolian Middle Pragian 91–92
- Sinemurian third-order sequences 555
- Slåen Edgeøya proximal facies 256
- Snadd Formation correlation of strata 176
- Sorokin Swell 339
 - geological cross-section 238
- Sørvestsnaget Basin stratigraphy 183
- South Anyui Suture
 - extension 318
- South Anyui Suture Zone 374
- South Barents Basin
 - Admiralty Arch 304
 - distributions and assessment 303
 - East Barents Sea Basins 304
 - geological analogues for sizes of undiscovered fields sizes 303
 - geological analogues for undiscovered fields sizes 302
 - geoseismic section 181
 - and Ludlov Saddle Assessment Unit 298, 304–305
 - Middle Late Jurassic stratigraphy 180
 - number, sizes and petroleum composition of undiscovered fields 304–305
 - petroleum composition and properties of undiscovered fields 305
 - seismic-geological model 332
 - stratigraphy 250
- Southern Hemisphere climate development 711
- Sukhan Motorchun Assessment Unit 422
- Svalbard
 - eastern palaeocurrent directions 258
 - mapping tectonic features 202–203
 - schematic lithostratigraphy 675
 - stratigraphy 250
- Svalbard Anticline 332
- Svalbard Severnaya Zemlja continental margin 695
- Sverdrup Basin
 - accumulation volumetric method 591
 - arctic uplifted areas 274
 - Carnian facies 552
 - channelized marine sandstones 557
 - cross-validation between methods 588–590
 - crude oil resource validation using undiscovered oil pool sizes 588–590
 - minimum pools size effects on resource predictions 590
 - natural gas resource validation 590
 - crustal velocity model 676
 - current assessment practice and preference 581–583
 - accumulation volumetric models 581–582
 - discovery process assessment models 582–583
 - depth below sea-level 578
 - discoveries and potential drilling targets 584
 - discovery data 584
 - discovery history 678
 - discovery process assessment 585–587
 - estimating number of accumulations 586–587
 - results 585–586
 - discovery process method 591
 - facies distribution third-order sequence 550
 - gas pool 588
 - gas pool correlation matrix 589
 - gas pool covariance matrix 588
 - gas wetness 578
 - geo-anchored assessment result diagrams 587
 - geology 568
 - Heiberg Formation at Yelverton Pass, Ellesmere Island 553
 - Hettangian facies 554
 - hydrocarbon fields 548
 - hydrocarbon potential 567–579
 - implications for hydrocarbon plays in Sverdrup Basin 576–578
 - formation of structures relative to hydrocarbon generation 576
 - generated oil 576
 - late petroleum system in northeastern Sverdrup Basin 576–578
 - source of natural gas in western Sverdrup Basin 576
 - improve petroleum resource assessment 581–592
 - Late Aalenian facies 556
 - Late Callovian facies 556
 - Late Kimmeridgian facies 556
 - mapped seismic closures 549
 - Mesozoic stratigraphic succession 585
 - multivariate discovery process model 592
 - Norian strata comprise 552
 - northern
 - Aalenian Sandy Point Formation 564–565
 - analytical methods 559–560
 - Carnian Pat Bay Formation 563
 - Early Triassic Blind Fiord Formation 563
 - geological setting 559
 - Pliensbachian Heiberg Formation 563–564
 - results 560–563
 - sediment provenance pathways 564
 - Tithonian Deer Bay Formation 565
 - U–Pb SIMS zircon geochronology 559–565
 - numbers of pools and resource potentials 586
 - oil and gas fields 547
 - past petroleum exploration and discoveries 546–547
 - petroleum resources 583–585
 - exploration history 585
 - geological setting 583
 - petroleum systems 583–585
 - petroleum systems 139
 - Phanerozoic burial and thermal episodes 567–569
 - geological history 567
 - tectono-stratigraphic assemblages 568–569
 - Pliensbachian Aalenian second-order sequences 555
 - predicted crude oil pool and natural gas pool size 586
 - predicted crude oil pool sizes 589
 - predicted natural gas pool sizes 589
 - prospectivity areas 547–549
 - regional setting 560
 - Rhaetian Sinemurian second-order sequence 554
 - salt diapirs and salt-cored uplifts 546
 - schematic lithostratigraphy 675
 - second-order sequence 550
 - siliciclastic sediment 546
 - Sinemurian third-order sequences 555
 - stratigraphic component prospects 549–557
 - Bajocian Callovian sequence 554
 - Carnian sequence 551–552
 - Lower Triassic sequence 549–551
 - Middle Triassic sequence 550–551
 - Norian sequence 552–553
 - Oxfordian Valanginian sequence 554–557
 - Pliensbachian Aalenian sequence 553–554
 - Rhaetian Sinemurian sequence 553
 - stratigraphic cross section 550
 - stratigraphic cross section of Mesozoic strata 548
 - stratigraphic section 678
 - stratigraphic thinning 546
 - stratigraphy 570
 - thermal maturity 567–579
 - thermal maturity dataset 570–576
 - depth v. maturity graphs 570
 - resolution of anomalous data 570–572
 - thermal maturity of Triassic Gore Point member 572–576
 - thermal maturity zones 549
 - Toarcian and Aalenian third-order sequences 555
 - Triassic Jurassic stratigraphy 547, 548
 - Triassic Jurassic succession petroleum prospectivity 545–557
 - vitrinite reflectance graph 576

- Sverdrup Basin (*Continued*)
 volumetric assessment 587–588, 590
 accumulation volumetric assessment 588
 accumulation volumetric assessment results 588
- Synoptic Boxes 21. *See* Chapter 2 foldout
- Taimyr orogens 315–316
 Arctic Uralides 314–315
 North American Cordillera 469–470
- Taimyr Peninsula
 simplified geology 315
 thrust ramps 316
- Taimyr Severozemelskiy fold system 220
- Tanopchinskaya petroleum systems 143
- Tarsiut Amauligak Pull-Apart (TAP) system 536
- Tejas II Lutetian 117–118
 palaeoenvironment and lithofacies 116
- Tejas II Rupelian 118–119
 palaeoenvironment and lithofacies 117
- Tejas I Ypresian 116–117
- Terranes of Northern Caledonian Baltican affinity 472–473
 arc and orogenic events 472
- Terranes of Siberian affinity in Alaska 470–472
 detrital zircons and basement ages 470–471
 oceanic and arc assemblages 471
- Thanetian
 Baffin Fan sequences 610–611
 Ypresian 116–117
- Thetis Basin Assessment Unit 669
- Thickness of sedimentary successions. *See* Chapter 2 foldout
- Thule Basin reflection profiles. *See* Chapter 40 foldout
- Timanian orogen in Eocene time 314
- Timanides
 Eurasian orogens fragments 312–313
 North American Cordillera 466–467
- Timan Pechora Basin
 assessment results **292**, 293
 assessment unit descriptions 287
 composite petroleum system 286
 cross section 285
 Domanik Paleozoic Composite Petroleum System 286–287
 potential petroleum source rocks 286–287
 timing of thermal maturation 287
 foredeep basins assessment unit 290–293
 charge probability 291
 co-product ratios and ancillary data 292–293
 geological analysis 291
 geological model for assessment 291
 numbers of undiscovered oil and gas fields 292
 rocks probability 291
 sizes and numbers of undiscovered fields 292
 sizes of undiscovered oil and gas fields 292
 timing and preservation probability 291–292
 geology and petroleum potential 283–293
 hydrocarbon systems **436**
 location 284
 main basin platform assessment unit 288
 charge probability 289
 co-product ratios and ancillary data 290
 geological analysis 289
 geological model 288–290
 numbers of undiscovered oil and gas fields 289
 rocks probability 289
 setting-compressional analogue set 289
 size of undiscovered oil and gas fields 289–290
 sizes and numbers of undiscovered fields 289–290
 timing and preservation probability 289
- NW Izhma depression assessment unit 287–288
 charge probability 288
 geological analysis 288
 geological model 287–288
 rocks probability 288
 timing and preservation probability 288
- petroleum systems 143
- sedimentary basin 224
 Caradocian Early Emsian 225–226
 change of oil composition 234
 Devonian source rocks 231
 distribution of zones of oil and gas accumulation 232
 genetic types of oils characteristics **235**
 geological setting 223–224
 hydrocarbon occurrence patterns 233–235
 hydrocarbons generation 230–233
 hydrocarbon system evolution **233**
 Khoreyver Depression sequence 234
 Late Viséan Early Permian 226–227
 Middle Frasnian Tournaisian 226
 oil and gas source rocks **229**
 oil and organic matter composition 234
 oil window 230
 organic buildups and infill deposits 228
 organic matter density 228
 Palaeozoic reef formation 223–235, 224–228, 227–228
 petroleum systems 228–235
 sedimentary basin 227
 seismic section 225
 source rocks 228–230
 seismogeological profile 334
 stratigraphic column 285
 stratigraphy 285
 structural and tectonic elements 338
 tectonic evolution 283–285
- Timan Pechora Province 435–436
- Tippecanoe I Caradocian
 global plate tectonic map 88
 palaeoenvironment and lithofacies 88
- Tippecanoe I Darriwilian Ashgillian 87
- Tippecanoe I Llandoveryan
 global plate tectonic map 89
 palaeoenvironment and lithofacies 89
- Tippecanoe I Lochkovian
 global plate tectonic map 92
 palaeoenvironment and lithofacies 92
- Tippecanoe I Wenlockian
 global plate tectonic map 90
 palaeoenvironment and lithofacies 90
- Tippecanoe II Llandoveryan 87–89
- Tippecanoe III Wenlockian Middle Pridolian 90–91
- Tippecanoe IV Middle Pridolian Middle Pragian 91–92
- Tithonian Deer Bay Formation 563, 565
- Tithonian Early Valanginian 108
- Toarcian third-order sequence 555
- Tortonian Gelasian 120–121
- Tournaisian reef formation 226
- TransArctic 1989–1991 refraction profiles
 acquisition configuration 408–409
 fields and seismic models 400
 gravity field 398
 refraction profiles 396
 seismic acquisition parameters **399**
 seismic profiles 397
- Tremadocian 84
 global plate tectonic map 85
 palaeoenvironment and lithofacies 85
- Triassic
 Arctic North America petroleum system 456
 Arctic North America petroleum systems 454
 clinof orm sequences 254
 Ellesmere Island strata 551
 greater Barents Sea 173–179
 Hazen F-54 well strata 551
 Ladinian sandstone strata 551
 Lomonosov Ridge source rocks 760
 maturity modelling 186
 Melville Island strata 551
 north and east margins of Siberian Craton 415–416
 northern Barents Sea clinof orms 252–255
 northern Barents Sea deltaic sequences 249–260
 northern Barents Sea sequences 251
 reservoir potential 173
 Roche Point Formation **573**
 Russian Arctic Shelf lithofacies 351–352
 seismic anomalies 266
 Sverdrup Basin sandstones 559–565
 Sverdrup Basin sequence 549–551
 Sverdrup Basin stratigraphy 547, 548
 Sverdrup Basin succession 545–557
 tectono-stratigraphic evolution 415
- Trondelag Platform petroleum systems 139
- Tuk segment Amundsen Gulf seismic profiles 536

- Tunguska Basin Assessment Unit
 geological analogues for assessment 429
 present-day structure 418
- Tunguska Basin Province
 lithostratigraphic column 417
 petroleum system events 417
 regression developed 91
- Two-vessel seismic operations 727
- Ungava Fault Zone Assessment 641
- Upper Absaroka I Ladinian 103
 global plate tectonic map 104
 palaeoenvironment and lithofacies 104
- Upper Absaroka I Norian
 global plate tectonic 105
 palaeoenvironment and lithofacies 105
- Upper Absaroka II Norian 103
- Upper Absaroka III Pliensbachian 103
 global plate tectonic 106
 palaeoenvironment and lithofacies 106
- Upper Tejas I Aquitanian 119–120
 palaeoenvironment and lithofacies 118
- Upper Tejas I Serravallian
 palaeoenvironment and lithofacies 119
- Upper Tejas II Serravallian 120
- Upper Tejas III Messinian 120–121
 palaeoenvironment and lithofacies 120
- Upper Zuni I Barremian 108–113
 global plate tectonic map 111
 palaeoenvironment and lithofacies 111
- Upper Zuni II Albian 114
 global plate tectonic map 112
 palaeoenvironment and lithofacies 112
- Upper Zuni III Turonian 114–115
 global plate tectonic map 113
 palaeoenvironment and lithofacies 113
- Upper Zuni IV Campanian 115–116
 palaeoenvironment and lithofacies 114
- Uralian Ocean 284
- Urals orogens of Circum-Arctic region 469–470
- US Chukchi Shelf
 depth display of line 1400. *See* Chapter 33 foldout
 exploration implications 506
 Franklinian section and related structures 504–505
 Hanna Trough 503–504
 map 502
 new seismic data 502–503
 North Chukchi Basin 503
 potential future plays 507
 regional geology 501–502
 seismic imaging of drilled sequences 503
 stratigraphic and tectonic framework exploration insights 501–507
 stratigraphy 504
 structure map on Moho reflector 506
 tectonic map. *See* Chapter 33 foldout
- USGS CARA project 12
- Ust Lena Graben
 AVO anomaly 365
 AVO attributes 366
 seismic records anomalies 367
- Ust Lena Rift seismic stratigraphy 380
- Valanginian Upper Zuni I Barremian 108–113
- Varandey Adzva structural zone 339
- Varneskoie morphological characteristics 269
- Verkhoyansk
 Eurasian orogens and Arctic tectonics 315–316
 terranes 96
- Vestspitsbergen Trough petroleum systems 142
- Vil'kitskii Rift System 385
- Viséan
 Serpukhovian tectonic and stratigraphic evolution 167–168
 Timan Pechora sedimentary basin 226–227
- Vøring Plateau depositional environment 708
- Vøring volcanic margin
 drill sites 706
 evolution 707
- Wandel Sea Basin Assessment Unit 670
- Wandel Sea Basin petroleum exploration
 offshore 658
 onshore 657–658
- Ward Hunt Island field camp 725
- Well 7019/1-1
 facies and reservoir 181
- Well 7131/4-1
 core section 177
 seismic section 177
- Western Fobos 268
- Western Fobos Trough 263. *See also* Northern Barents Basin
- Western Hemisphere
 Arctic basins 137–139
 source-reservoir-seal systems 140
- West Greenland East Canada Province
 assessment results 634, 642–643
 assessment unit definitions 632
- Baffin Bay Basin AU description 639–640
 co-product ratios and ancillary data 640
 geological analysis 639–640
 geological model for assessment 639
 numbers of undiscovered oil and gas fields 640
 revised deltas analogue set 640
 rocks probability 639–640
 sizes and numbers of undiscovered fields 640
 sizes of undiscovered oil and gas fields 640
 timing and preservation probability 640
- Eurekan structures AU description 632–635
 co-product ratios and ancillary data 633–635
 geological analysis 632–633
 geological model for assessment 632
 numbers of undiscovered oil and gas fields 633
 rocks probability 633
 sites of undiscovered oil and gas fields 633
 sizes and numbers of undiscovered fields 633
 structural setting 633
 timing and preservation probability 633
 geology and petroleum potential 624–643
- Greater Ungava Fault Zone AU description 640–642
 charge probability 641
 co-product ratios and ancillary data 642
 geological analysis 641
 geological model for assessment 640–641
 numbers of undiscovered oil and gas fields 641–642
 rocks probability 641
 sizes and numbers of undiscovered fields 641–642
 sizes of undiscovered oil and gas fields 642
 time and preservation probability 641
- location 628
- Mesozoic Cenozoic composite petroleum system 631–632
- NE Canada rifted margin AU description 637–639
 charge probability 638
 co-product ratios and ancillary data 639
 geological analysis 638
 geological model for assessment 637–638
 numbers of undiscovered oil and gas fields 638
 rocks probability 638
 size and numbers of undiscovered fields 638–639
 sizes of undiscovered oil and gas fields 638
 timing and preservation probability 638
- NW Greenland rifted margin AU description 635–637
 co-product ratios and ancillary data 637
 geological analysis 635–637
 geological model for assessment 635
 numbers of undiscovered oil and gas fields 637
 size of undiscovered oil and gas fields 637
 sizes and numbers of undiscovered fields 637
 timing and preservation probability 636–637
- petroleum system map 631
 regional 629
 seismic profile 633
 stratigraphic column 630
 stratigraphy 630–631
 Tectonic evolution 627–630
 thermal maturities 636
- Wildcat wells, discoveries 2
- Wrangel Herald Arch 375
- Wrangel Island 374, 387

- Yanovstanskaya petroleum systems 143
- Yenisey Khatanga Basin
petroleum systems 143
regional geological cross section 416
- Yenisey Khatanga Basin Assessment Unit
densities 426
geological analogues for assessment 428–429
input distributions and assessment 427
- Yenisey Khatanga Basin Province
burial-history diagram 419
- Khatanga Saddle Assessment Unit 420
lithostratigraphic column and total petroleum system events 419
north and east margins of Siberian Craton 418–420
source rocks 418
- Yermak Plateau geophysical exploration 696
- Ypresian 116–117
- Zhelaniya Cape High 263. *See also* Northern Barents Basin
- Zuni II Kimmeridgian 108. *See also* Lower Zuni I, Bajocian;
Upper Zuni I, Barremian