

Index

Page numbers in *italics* refer to Figures. Page numbers in **bold** refer to Tables and the Foldout.

- accretion 17, 19, 84, 118, 190
accretionary complex 39, 46–47
accretionary prism/wedge 44, 68, 79, 179, 194
adakite series dykes 114, 123
Adio Limestone 63–65, 68, 79, 81, 118, 198
 manganese deposit 223
aeolianites 168–170, 171
Agathis [conifer] iconic taxa 202
age *see* geochronology
aggregate resource 231–232
Aiguille de Prony, thermal springs 236–238
alkaline hypothesis, origin of life 238
allochthonous cover rocks 55, 56–58, 95
 mineralization 225
alluvial and littoral deposits 248, 269–271
alluvium, Grande Terre 171
Amborella [shrub], iconic taxa 202, 204
Amédée borehole 175, 176
ammonite 59, 198
amphibolite sole 103, 106, 114, 120, 122
 age 116
angiosperm 196, 197, 202
anoxic conditions 192, 193, 195
 lagoon 173
antigorite 115
antimony 222, 223, 224, 228
Aotea Basin 83
aquifers in peridotite protolith 153–154
aquitard, saprolite and laterite 154
Araucariaceae, iconic taxa 202, 204, 205
archaeology, jade artefacts 233
argillite 77
arsenic deposit 218, 222–223, 224, 226, 228
asbestos, naturally occurring 231–232
asbolane 259, 260
assemblages, Grande Terre and Loyalty Islands 4–5 **foldout**
atolls 131, 134, 136
 biota endemism 204
 fauna 199
 uplift 138
Australia
 basement terrane correlation 44–45
 provenance 47
 rifting 48
 zircon age pattern 45–46
Australian Plate 2, 14–18, 21, 139, 179
 ferricrete palaeomagnetism 157
autochthonous cover rocks 54–56, 57
 mineralization 225
 Paleocene 62–65
back-arc basin 13, 17, 21, 97–98, 118, 119
 basement terrane 40–41, 43, 47
 geochemistry 36–37
Baie de Prony, thermo-mineral springs 236–238
Baie de Saint Vincent 28, 31
 aeolianites 168–170, 171
 chromite resources 270
 fossil flora 197
 mineralization 229
 stratigraphy 71, 72
Baie de Saint Vincent Group 29
Baie de Téremba Group 28–29
Balade mine 221, 222, 223
banding, compositional 109, 110, 114
barite 218–219, 222, 230–231
 nodules 56
barrier reef 1, 135, 173–174, 175, 179–180, 194
 age/stratigraphic log 176
basal sole 106, 116, 120–121, 161, 177
basalt, Poya Terrane 96–98
basement assemblage 4–5 **foldout**
basement terranes, Gondwana active margin 5, 27–43
 age and provenance 45–46
 regional correlation 44–45
 tectonic model, reconstruction 46–49
basement, Grande Terre 191–192
basement, SW Pacific 15, 21
 age 16
basin development, geodynamics 13–21
bat, modern species 202
bathymetry 14, 138, 173
 Maré Island 132–133
 northern Zealandia 169
 SW Pacific 82, 190
Beautemps–Beaupré atoll 138
Bélep Islands 110
 upwarp surface 155
benthic fauna, seamounts 202
beresitization 225–226
bioclastic limestone 73
biodiversity hotspot 189
biohydrometallurgy, scandium 267
biostratigraphic marker 59
biota, age spectrum 204–206
biota, endemic 200–202
biota, iconic 202–205
bird fossils 199, 200
birds, flightless 200, 202–205
birnessite 260, 268
bismuth 222
 mineralization 226, 228
black argillite 37–38, 56, 70, 96, 192
black chert 64, 217, 220
Black Cherts Formation 54, 56, 58, 59, 75, 81, 101, 193
 mineralization 230–231
black schist 40, 219–220
black shale 45, 56, 59–60, 61, 226
blue latex in plants 202, 203
blueschist 39–42, 100–104, 116
Boghen Terrane 39–45, 191, 217
 clasts 58, 63, 73
 jade 233
 tectonic reconstruction 46–48
Bogota Peninsula, structural data 111
boninite 33–34, 36–37, 47, 114
boreholes 15
 Deep Sea Drilling Program 4, 81, 83, 141, 168, 169
 hydrocarbon prospecting 230, 234–235
 Ilot Amédée 173, 175, 176
 Loyalty Islands 133, 134
 reef barrier 173
boudinage 110, 111, 113
Bougainville Seamount/Guyot 14, 19, 141
Bourail Group 65, 66, 70, 71, 81, 116, 118
 depozone 79, 80
 offshore 75
breccia 58, 65–68, 74, 78
brecciated serpentinite mylonite 105
bryonoderm 63–65, 68, 79, 81
Bureau de Recherches Géologiques et Minières (BRGM)
 mapping programme 3
cagou [flightless bird] 202, 203, 204–205
Cagou Trough 142
calcrete 170–172
Caledonites nodules 59
Caledonites sp. [ammonite] 198
Camp des Sapins, mines 262–266
Cantaloupai unit, ophiolite 34–35
canyons 163, 174–175
carbon dioxide sequestration 229, 238
carbonate 63, 65
 Grande Terre 158–162
carbonate platform 2, 5, 21, 194, 195
 cover rocks 73, 78, 79, 81
 mineralization 230, 231
 Neogene 134, 168
 Paleogene 198
 remnants 68, 70
carbonate ramp 161, 162, 175
carbonization 223
cave and sinkhole, Quaternary deposits 171
cement 233, 238
cementation front 259
Central Chain Klippes 105
Central Range Terrane, reconstruction 46–48
Central Range Volcaniclastic rocks 37–39
Central Range, sedimentary cover rocks 39, 45
Central Terrane, clasts 63, 73
chalcopyrite 217–220, 221, 225–226, 228
chemical weathering 154
chert 96
 basement rocks 33–34, 37–38, 43, 47
 cover rocks 56, 59, 64–66, 70, 74
Chesterfield Islands, atolls and volcanoes 217
chromite 77, 105, 217, 223, 248
 alluvial deposits 269–270
chromite sand 271
chromitite 248–255, 268–269, 271

- chromium 153, 164
 in laterite 268
 mineral resources 247
 production and mining 248–252
- chrysoprase 234
- cinnabar deposit 227
- clay minerals 233
- clay silicate deposits 255
- cleavage 42
- climate 194, 230
 change 152, 173
 Oligocene–Present 176
- climatic optimum, Mid-Miocene 137, 166
- clinopyroxene, detrital 74, 75, 79
- CO₂ sequestration 229, 238
- coal 55, 58, 81, 217, 230, 234
- Coal Formation 54
- coal measures 195
- cobalt 3, 4
 mineral resource 247, 257, 258, 262
 minerals and mining 267–268
- Col de Boghen Group 54
- conglomerate 56, 63, 64, 72, 160,
 162–164, 168
- Congo River Conglomerate 54, 60
- continental flood basalt 62
- continental plate 190
- convergence 84, 85, 193–194
 Australian–Pacific 196
 Eocene 78
 Paleocene 53
 rate of 14, 81
 Vanuatu 136–137
 subduction/obduction complex
 116–119
- Cook's Pine 202
- copper deposit 217–219, 220, 222, 228
- coral 199, 202
 reef 135–137
- coralgal association 72, 73, 75, 79, 134
- correlation 94
 basement terrane 44–45
 subduction/obduction, SW Pacific
 122–123
- cover rocks, rifting to convergence 53–85
 correlation and offshore data 81–85
 Eocene 65–81
 Late Cretaceous 53–62, 197
 Paleocene 62–65
- Creek Aymes Limestone 68, 72, 79, 81
- foralgal 198
- Cretaceous, fossil record 197–198
- crocodile fossil 199
- crustal thickness 13, 19
- cryptomelane 157
- cumulate 107, 108, 120, 249–250, 254
 age 120
 mafic/ultramafic 112
- d'Entrecasteaux Zone 132, 139, 140–141
- data synthesis 1
- database, geological 4, 53
- debris flow 73, 74, 76
- Deep Sea Drilling Program 4, 81, 83
 Back-arc basin 141
 boreholes 168, 169, 235
- deep sea fan 43, 44, 47
- deep water fold–thrust belt 167–168, 179
- deep water sediments 175–176, 191, 193
- depositional environment 168, 196
 cover sediments 54–56, 64–65
 Fluvio-lacustrine Formation 166
- Neogene 159, 160, 163
- detrital zircon age 38–39
- Diahot–Panié Metamorphic Complex
 101–102
 Térémba Terrane 45–46
- detrital zircon provenance 60–61, 84
- Gondwanan 41–42, 45–48
 Koné Facies 99
- deweylite 260, 262, 264
- diagenetic Fe oxides 165
- Diahot Basin 222, 223
 mineral deposits 219, 220
- Diahot Volcanic Rocks 56
- Diahot–Panié Metamorphic Complex 222
 age 104
 cover rocks 53–58, 60–62
 HP-LT metamorphism 100–102, 116,
 118, 119
 limestone 65
 mineral deposits 219, 220
- Diahot–Panié Terrane 100
- dimension stone 233
- dolerite, Koné Facies 99
- dolomite 134
- dolomitization 135–136
- drainage and uplift 166
- dredging 139, 147, 151, 173, 175
 Neogene samples 158, 162, 167, 168
 Three Kings Ridge 141, 142
- DSDP *see* Deep Sea Drilling Program
- Dumbéa Group 53, 55
- Dun Mountain Basin 47, 48
- dunes 169, 170
- dunite 105, 107, 108, 109, 247
 podiform chromitite 248, 250–251, 254
- dyke complex 35, 122
 age 120
- dykes 109–110
 Koum gold deposit 224–225
 Peridotite Nappe 113–114
 pyroxenite 109–110
 weathering 149–150
- earthquake 174, 179
- eclogite facies 54, 100, 102, 104, 116,
 119, 223
- economic data, metallogenic
 deposits 224
- EEZ *see* Exclusive Economic Zone
- El Niño–Southern Oscillation 171
- electrum 217, 219
- endemic species 197–200, 201
- endemism 29, 47, 59, 60, 84, 189
- environmental damage 255–257, 269, 270
- environmental sensitivity, reef communi-
 ties 173–174
- Eocene convergence and subduction 5
- Eocene cover rocks 65–81
- Eocene Subduction–Obduction Complex
 93–123
- epithermal ore bodies 149
- erosion and weathering profiles 164
- eustatic variation 161
- Exclusive Economic Zone, New Caledo-
 nia 1, 3, 4, 215, 216, 234, 236
- exhalative mineralization 218
- exhumation 150
 age 116–118
 HP-LT Metamorphic Belt 104
 rate of 119–120
- exploration, New Caledonia 3
- extension 84, 168
- Late Cretaceous 53
- Paleocene 17
- extinction 189
 Cretaceous–Paleogene 195, 198
 and human occupation 199, 200
 Permian–Triassic 29, 197
- fabric 109–110, 115, 250
- Fairway Basin 82, 195
 hydrocarbon potential 236
- Fairway Ridge 82–83, 84, 168
- faults, active 174
- faults, offshore Grande Terre 168
- faunal affinity 29
- Félicité Ridge 122
 unroofing 116
- Fern Hill mine 221, 222, 223
- Fern Hill, gold deposit 219
- ferricrete 72, 152–157, 164–166
 in ultramafic rocks 258–259,
 261–264, 269
- ferromanganese crust, seafloor 228
- fish, diadromous 202
- flexural foreland basin 85
- flightless birds and insects 200, 202–205
- flora 197 *see also* plants
 modern 200, 202
- flow structure, crystal cumulate
 108, 110
- Fluvio-lacustrine Formation 164–166
 chromite resources 270
 platinum minerals 271
- flysch 85, 96, 118
- foliation 42, 102, 120, 223
 antiform 119
 Peridotite Nappe 104, 106–107,
 109–111, 113–114
 ultramafic rocks 250–251
- foralgal biofacies 68, 70, 72,
 73–75, 198
- foralgal nodules 135
- forearc basins 5, 21
- forebulge 85
 depozone 79, 80, 81, 118
 rate of uplift 138
 Vanuatu 175, 179–180, 194
- foreland basin, Grande Terre 118–123
- Formation à Charbon 53–60, 192,
 198, 200
 coal 234
 fossil flora 197
 zircon age 99
- fossil 169
 biozones 77–78
 endemism 197
 index for Térémba Terrane 32
 insect 156, 200
 Loyalty Islands 133, 134
 Neogene 159
 record 196–200
- fossils 28–29, 33, 38, 56, 72, 73 *see also*
 plant debris
 cover rocks, Late Cretaceous 197
 cover rocks, Paleocene 63–65
 Diahot–Panié Metamorphic Complex
 101
 Poya Terrane 99
- fractures
 atolls 138, 140
 and mineralization 265
 weathering and mass wasting
 155, 171

- gabbronorite cumulate 108, 110, 112, 114
galena 217–222, 227
garnierite 153, 156, 163, 255, 258, 262
 formation 260
gas hydrate field 236
gemstones 230, 233–234
geochemistry 3, 47
 dykes 114
 Fluvio-lacustrine Formation 165
 granitoids 150–152
 Koné Facies 99–100
 Late Cretaceous volcanics 61
 peridotite 111–112
 Poya Terrane 97–98, 99
 regolith 152–153
 Téremba Terrane 30–31, 34, 35–36, 39, 40
geochronology
 coral reef 136–137
 cover rocks 59–60
 dykes 114
 Fluvio-lacustrine Formation 166
 foreland basin 117
 granitoids 149
 hardground 134, 137
 Népoui–Koumac Group 77–78
 Peridotite Nappe 112–113
 post-obduction deposits 176, 177
 Poya Terrane 97, 99
 regolith 155–157
 subduction/obduction complex 116, 117
 Téremba Terrane 28–29, 35, 38–39, 40
 Upper Népoui Formation 161
 vertisol 171
 volcanic rocks 81
geodynamics 1–2, 192–194
 post-obduction 176–180
 subduction/obduction complex 116–118
 SW Pacific plate 13–21
geological events, Late Cretaceous to Present 195
geology, New Caledonia
 future research topics 6
 history of research 3–4
 map 4–5 **foldout**, 6
 summary/review 189–196
geothermobarometry 5, 114
 HP–LT Metamorphic Belt 102–104
geothermometry 111
gigantism 200
glacial events and lagoon development 169, 174
glauconite 56, 64–65, 68, 70, 72
goethite 172, 255
 isotope dating 157
 Ni content 260
 nodules 163, 164, 165
gold 57, 84, 96, 101
 deposits 217–219, 220, 222–228
 mineralization 149, 150
Gondé sub-terrane 40, 45
Gondwana 1–2, 5
 active margin, basement terranes 27–49
 break up 13–21, 53, 84, 189–193
 fossil record 197–199
 plate reconstruction 17
 provenance 41
 vicariance 204–206
Goro mine 153, 156
 nickel deposit 260, 261, 262
 scandium content 269
Goro, ferricrete 155, 157
graben and rifts 192
Grande Terre 2, 3, 53, 57, 65, 109, 117
 assemblages and terranes 4–5 **foldout**
 drainage 166
 flooding 204, 206
 foreland basin 118–123
 geology 190–194, 215–217
 granitoids 147–152
 gravity 94
 landforms 153
 metamorphic domain 100, 101
 mineral resources 247
 mining sites 257
 Neogene deposits 158–168
 palaeomagnetism 157
 Peridotite Nappe 104–105, 106–107
 Subduction–Obduction Complex 93, 94–95
 thermo-mineral springs 237
 upwarp surface 155
granite, weathering 157
granitoid, Mesozoic 47
granitoids, Late Oligocene 147–152
 age, emplacement depth 150
 geochemistry 150–152, 178
 mineral composition 149
granodiorite, mineralization 223–226, 228
gravity anomaly 104, 179
 free air 13, 14, 94, 140, 141
gravity model, Peridotite Nappe 116
greenschist 39, 40–42, 102, 103
greywacke 34, 37, 39, 48, 60, 61
 aggregate source 232
 geochemistry 30–31, 34, 44
guyot 140, 141
Gwa N'Doro Formation 158, 163–164
gypsum 229–230
 in vertisol 171
haematite/hematite 260
half-graben structures 177
hardground 134, 135–136
harzburgite 105–107, 109–112, 115, 123, 247
 podiform chromitite 248, 250, 253
Havanah Fault 174, 179
health hazard, ultramafic rocks 232
Hienghèhe, double notch 173, 175
Holocene reef 166, 173, 174–175, 176
horst and graben structure 195
 seismic profile 84
hotspot trail 13, 15, 20, 21, 134, 138, 168, 217
HP–LT Metamorphic Belt 100–104, 116, 118
 terrane review 119–120
human occupation and bioextinction 199
human remains, karst caves 233
hydrocarbon 230, 234–236
 potential 215, 216
 source rock 55, 81
hydroplastic deformation 156, 164, 258
hydrothermal alteration 61, 78, 149–150
 and mineralization 217–219, 222–223, 226, 228
hydrous Mg silicate deposits 255–257, 259, 260–265, 267, 271
hyperaccumulators, plants 201–202
hyperalkaline springs, ultramafic rocks 236–238
hypogene deposits 247, 248–255, 271
ichnospecies 199
Ile des Pins 157
 aeolianites 168–170
 upwarp surface 155
Ile Hugon, aeolianites 169, 171, 172
Ile Ouen, chromite occurrence 254
Ile Ouen, platinum minerals 271
Ilot Amédée 173, 175, 176
Ilots Champignon, aeolianite 169
imbricate thrust complex 96
imbricated pebbles 160, 163
infra-ophiolite metamorphic sole 120
inoceramids 198
insect fossil 166
interglacial palaeoshoreline 138
intermontane mass wasting 166
intra-montane basins 164
intra-plate volcanism 195–196
inversion 121
iron 248
 Fe oxide stalactites 165, 258
 Fe oxy-hydroxide 255, 259, 260
 Fe–Mg-carpholite 220
 mining/mineral resources 247, 269
island arc basalt 36, 47, 61, 62, 98, 114
island arc terrane 27–31, 32–33
isostatic rebound 166
jade 230, 233–234
jasper 96
Jurassic, fossil record 196–197
kanak people, jade sources 233–234
kaolinite 165, 233
karst 131, 134, 138, 153–155, 163
karst caves
 faunal remains 199, 233
 phosphate deposit 230, 231
Kendec borehole 175
Koh Ophiolite 31, 33–34, 35–37, 45, 217
Koh Terrane
 clasts 73
 tectonic reconstruction 46–48
Koh–Central Terrane 31–39, 101
Koné Facies 96–100, 116, 119
Koniambo 78, 248
 nickel deposit 257, 261, 263–264, 266, 269, 271
 peridotite klippe 77
Kopéto, nickel deposit 267
Koum gold deposit 224–226, 228
Koum–Borindi pluton 147–152
Koumac 77–78, 230
 oil seep 230, 234
Koumac River section 67
Koumac to Ouégoa road section 100
Koumac Turbidite and Breccia Formation 76
La Crouen thermal baths 236
La Foa unit 38
lacustrine deposits 166
 Quaternary 171
lagoon 135
 barrier reef system 194
 fossils 199
 sediment deposition 169–170, 172–175
 UNESCO World Heritage Protected Area 232
landforms, regolith 153–155

- landslide, mining areas 154, 262–266, 267
 landslide, Peridotite Nappe 171–172
 large ion lithophile elements (LILE)
 40–41, 43
 cover rocks 61
 Téremba Terrane 30
 Late Oligocene Warm Event, weathering
 157, 177
 Late Quaternary cyclicity 175
 laterite 1, 21, 152–155, 163–164
 development and mineral concentration
 258–260
 nickel ore 1, 255, 258, 259, 266
 weathering 105
 lattice preferred orientation 109–111
 lawsonite 100, 102
 lead deposit 219, 220, 222, 223
 Lekine cliff 137
 lherzolite 105, 106, 110, 111–112, 120,
 123, 247
 chromitite 248, 251, 253
 Lifou atoll 131, 132, 136
 fractures 140
 marine terrace 137, 138
 limestone
 aggregate resource 231
 and basalt in atolls 131–138
 use in nickel industry 233
 lineation 107, 111, 120
 stretching 42, 102, 104, 109, 110, 114,
 250–251
 and mineralization 222, 223
 liswanites *see* silica-carbonate
 lithiophorite 260, 268
 lithium mineralization 228
 Little Ice Age 171
 lizardite 115
 Lord Howe Rise 28, 46, 84, 168, 195
 hotspot trail 217
 provenance 31, 45
 tectonics 47, 82, 83
 Lower Bourail Turbidites 68–69, 72,
 73–74, 80, 81
 Lower Népoui Formation 158–159
 Loyalty Basin 93–94, 105, 116, 119–121
 sedimentary fill 166–168, 192
 Loyalty Islands 2, 138, 192, 194
 assemblages and terranes 4–5 **foldout**
 atoll reef 135–138
 Miocene basalt and rhodolith platform
 131–134
 offshore geology 138–142
 phosphate 231
 Pliocene emergence 204
 Loyalty Ridge 82, 131, 132, 138–142, 179
 mineral resources 216, 217

 magmatic enclaves 149
 magmatism 40
 subduction related 45, 47, 62
 magnesite 155–156, 160, 228–229
 concretions 177
 mineral resource 230
 magnesium *see also* hydrous Mg silicate
 mineral resource 230
 magnetic anomaly 14, 15, 17, 44, 96
 Loyalty Ridge 140, 141
 magnetic residual signal and
 weathering 177
 magnetic survey 109, 133
 magnetically dated ferricrete 157
 magnetobiostratigraphic study 66

 Mamelons Rouges Formation 81, 216
 fossils 59, 197, 198, 219–220
 post-rift deposits 54, 56, 58, 101, 217
 manganese 63, 65, 96, 97
 deposits 217–219
 mangrove 173
 mantle 114–116
 source 31, 104–105, 107–108, 109, 112
 ultramafic sequence 247–248, 250–253,
 255, 269–271
 wedge 62, 78, 119, 120, 150
 Maori palaeo-bio-province 29, 47, 60,
 197, 198
 map and stratigraphic sequence 4–5
 foldout
 Maré atoll 131–138
 basalts 131–134
 marine isotope stages 173, 175, 176
 marine notch 137
 Hienghène 173
 Ilots Champignon 169
 marine sedimentary rocks,
 Oligocene–Miocene 168
 marine terrace, dating 137–138
 mass extinction,
 Cretaceous–Paleogene 198
 mass extinction, Permian–Triassic 29, 197
 mass wasting, Peridotite Nappe 171–172
 Massif du Sud 148, 149, 156, 223
 age 157
 chromitite mines 249
 Fluvio-lacustrine Formation 158
 foliation/lineation 107, 110, 120
 mass wasting 171–172
 mineralization 228
 nickel deposits 261–264, 265
 terrestrial deposits 166
 thermal springs 236–238
 weathering surfaces 154–155
 Matthew and Hunter islands 1, 4,
 228, 229
 Medieval Warm Period 172
 mélange 39, 43, 46, 60–61, 102
 mercury, mineralization 223, 224,
 227–228
 Mérétrice, Pb-Zn deposit 220–223
 Mesozoic subduction complex 5
 metallogeny, advances 3
 metamorphic complex 39–43, 44
 age 117
 metamorphic sole 106, 114
 metamorphism 42, 45–48
 cover rocks 53
 Eocene 38–39, 45
 Subduction–Obduction Complex
 102–104
 metasomatism 112
 micrite 66, 68, 74, 96
 mid-ocean ridge basalt (MORB) 40–41,
 43–44, 61, 62, 118
 basalt clast 74, 76
 Maré basalts 133
 offshore sample 96
 Poya Terrane 97–98
 Téremba Terrane 30, 34
 mid-Holocene highstand 136, 137
 millerite 252, 260
 Mine d’Huile 230
 Mineral Resources Survey 215, 217, 219,
 223, 224, 226, 247
 mineral resources, metallic 3
 geological setting 215–217
 post-obduction magmatism 223–228
 submarine volcanism 217–223
 mineral resources, non-metallic 228–233
 gemstones 233–234
 hydrocarbons 234–236
 mineral resources, ultramafic rocks
 247–271
 alluvial and littoral deposits 269–271
 hypogene deposits 248–255
 supergene deposits 255–269
 mineralogy, regolith 152–153
 mining terminology 247
 Miocene, subduction 21
 Moindou coal mine 230, 234
 molecular biology data 204–206
 molluscs, lagoonal 202
 molybdenum 150, 222, 226, 228
Monotis beds 29, 33, 38, 196
 Mont Panié, metamorphic belt 100
 Mont Rembaï area 69–70
 Montagne des Sources, mantle to crust
 section 107–108, 110
 Montagnes Blanches Nappe 53–58, 63,
 79, 81, 85
 Subduction–Obduction Complex
 93–96, 100, 101, 116, 118–119,
 123
 Muéo Formation 162–163, 179
 Muéo Peninsula, conglomerate 160
 mylonite 110, 115, 120

 Nakéty antimony deposit 226–228
 nappe 4–5 **foldout**, 13
 Nassirah, stratigraphy 71, 73
 neodymium isotope 30–31, 34, 112
 granitoids 150–152, 178
 Neogene
 fossils 198–199
 tectonic model, post-obduction 179
 weathering 271
 Neogene–Quaternary, tectonics
 179–180
 nephrite jade 233
 Népoui Group 158–168
 fossils 198–199
 mineralization 228–229
 Népoui Turbidite and Breccia Formation
 76–77
 Népoui–Koumac Group 75–79
 nepouite 260
 Néra River section 69
 Nétéa sub-terrane 40
 New Caledonia Geological Survey 4
 New Caledonia Trough 82, 83, 84,
 166–168
 New Caledonia–New Zealand
 basement 28
 New Caledonia, geography 1, 2
 New Caledonia, geology and stratigraphy
 4–5 **foldout**
 New Hebrides–Vanuata Trench 14, 19
 subduction 21
 New Monta prospect 217
 New Zealand 123
 basement terrane correlation 44–45
 zircon age pattern 45
 nickel 229
 deposit 1, 3–4, 21, 105, 152–153,
 154, 219
 future exploration and production
 266–267
 mass waste deposits, mining 171

- in plants 202
 resource, reserve 247, 262
 supergene ore deposit 217, 255–267
 grade and production statistics 256–257, **258**
 mining history 255–257
 niobium 36, 40–41, 114
 cover rocks 61
 Koné Facies 100
 Poya Terrane 97–98
 nomenclature, cover rocks 53, **56**
 nomenclature, geological units 4–5
 foldout
 Norfolk Ridge 62, 65, 78, 82, 83–85, 179, 192
 mineral resources 216, 228, 270–271
 seamounts 168
 subduction–obduction 93–95, 116, 194
 thermal subsidence and flooding 205
 North Fiji back-arc extension basin 228, 229
 North Loyalty Basin 94
Nothofagus [false beech] iconic taxa 202, 204
 Nouméa Peninsula 58, 76, 232
 olistostrome 75
 Nouméa–Dumbéa unit 38, 61, 62
- obduction 78, 83, 85, 194, 195
 first use of term 93
 Peridotite Nappe age 204
 oblique convergence model 121
 ocean island basalt 40–41, 43, 61, 62, 98
 Loyalty Ridge 139
 Maré basalts 133
 oceanic crust 15, 31, 116, 119, 166, 178
 age 17, 27
 Office de la Recherche Scientifique et Technique Outre-Mer 3–4
 offshore *see also* dredging
 basins, oil and gas 234
 geological survey 4
 hydrocarbon potential 235–236
 metallic resources 228
 Neogene deposits 166–168
 seismic section, Peridotite Nappe 115–116
 offshore, Zealandia
 Eocene 83
 Late Cretaceous to Paleocene 81–83
 oil and gas 230, 234–246
 Oligocene–Present, subduction 19–21
 Oligocene, tectonic model 178–179
 olistolith 66, 73, 75, 76, 77, 96
 olistostrome 66, 68, 75, 80, 81, 118
 opal 153, 160, 234
 diagenetic front 236
 ophiolite 31, 33–34, 107, 111, 120–123
 ophiolitic mélange 102, 119
 ORSTOM *see* Office de la Recherche Scientifique et Technique Outre-Mer
 Oua Méni, stratigraphy 71
 Ouégoa area 103, 104
 Ouen Island, jade 233
 Ouen Toro, borehole 234
 Ouvéa lagoon 168, 170
 Ouvéa, atoll 131, 132
 marine terraces 137
 tilted surface 138
 oxygen isotope curve, Late Cretaceous to Present 195
- Pacific Plate 2, 14–18
 palaeo-lagoon 138
 palaeo-latitude 20, 152, 177, 192, 195, 197
 palaeo-river 95, 174
 palaeo-shoreline 136, 137
 palaeo-surface 162, 167
 palaeo-valley 164–165, 169
 palaeo-wind 170
 palaeobiogeography 189–196, 203–206
 fossil record 196–200
 geological summary 189–196
 modern biota 200–203
 Téremba Terrane 29–30
 palaeomagnetism 36, 37, 117
 dating 166
 ferricrete 156–157
 Poya basalts 98
 palaeontology 27, 59–60
 data 53
 Paleocene cover rocks 62–65
 Paleogene, fossils 198
 palladium, occurrence 254–255
 palynoflora 29, 59, 197
 Papuan and New Caledonia ultramafic belt 122
 pargasite 251
 passive margin 168, 178, 179
 passive obduction model 121
 pedogenic origin, carcrete 171
 pedogenic surface features 160
 pentlandite 252, 260
 peridotite karst 153
 Peridotite Nappe 1–3, 19, 69, 85, 101, 123
 age 112–113, 117
 dykes 113–114
 emplacement model 121
 exhumation and erosion 116, 194
 fabric 109–110
 high temperature shear zone 110–111
 HP–LT metamorphic belt 93, 94–95
 jade source 233–234
 landslide 171–172
 lithology 105, 107, 108
 mineralization 228
 obduction, timing 176–177
 offshore 115–116
 outcrop and structure 104–105, 106–107
 petrology and geochemistry 111–112
 review 120–121
 serpentinization and fracturing 114–115
 weathering 152, 153–154
 peridotite, carbonatization 238
 peridotite, weathering 156
 Permian, fossil record 196
 petrology, peridotite 111–112
 phosphate 138, 216
 ore and resource 230, 231
 photomicrograph 97, 115
 limestones 68
 Peridotite Nappe rocks 110
 phreatomagmatic eruption 131
 Pilou mine **221**, 223
 Pindai Conglomerate 160, 162, 164, 179
 plant remains 199
 Pirogues river basin, capture 164, 166
 Plaine des Lacs 166
 saprolite 260
 planation surface 154–155
 age 177
- plant debris 29, 55, 56, 60
 plant fossils 160, 163–164, 166, 193, 199
 Téremba Terrane 197
 plastic flow 109, 153
 plate tectonics 1–2, 176, 190, 191, 198
 models 14–21
 summary 84–85
 Platinum Group Elements 248, 252–255, 268–269, 270
 Platinum Group Minerals 216, 247
 alluvial deposits 270–271
 in laterite 268–269
 occurrence 254–255
 Pleistocene–Holocene 137–138
 fossils 199, 200
 Pliocene–Pleistocene atoll reef 135–137
 pluton 147–152
 exhumation age 228
 Pocquereux–Nassirah–Koua unit 28, 33, 35
 podiform chromite/chromitite 248–253, 255, 271
 polarity, subduction 19, 21, 190
 Ponérihouen Goipin unit 38
 porphyry deposits 228
 gold 149–150, 226
 Port Boisé ferricrete 156
 post-obduction assemblage 4–5 **foldout**
 post-obduction evolution 177
 mineralization 223–228
 Neogene deposits 158–168
 Oligocene granitoids 147–152
 Quaternary deposits 168–176
 regolith development 152–157
 tectonic models 176–180
 post-rift formations 56, 58
 Pouébo Terrane 100, 101, 102, 116–119
 age 104
 volcanogenic massive sulfide 219
 Pouembout unit 38–39
 Poya Terrane 56, 66, 74–81, 85, 123
 age 117
 basalt 93–100, 101, 112, 114, 116, 118–119
 palaeontology 100, 102
 volcanogenic massive sulfide 218–219
 pre-Late Cretaceous terranes 45, 46
 pre-obduction assemblage 4–5 **foldout**
 Prony Basin 156
 protolith 40, 57, 100, 114, 120
 provenance *see also* detrital zircon
 Eocene flysch 79, 80
 pre-Late Cretaceous sediment 31
 pseudo-karst 153
 psilomelane 219
 pygmatic folds 153
 pyrolusite 219
 pyroxenite 247, 253–255, 258
- Quaternary deposits
 offshore 172–176
 onshore 168–172
 Queyras prospect 218
- radioactive waste, storage 238
 radiometric age 29, 59, 60, 104
 HP–LT Metamorphic Belt 103
 ramp anticline 68, 69

- rare earth elements (REE) 36, 40–41, 43, 131–134
 cover rocks 61
 granitoids 150–152, 178
 Koné Facies 100
 Peridotite Nappe 111–112, 114
 Poya Terrane 97–98, 99
 Térémba Terrane 30, 34
 Rawa Limestone 133, 134
 Red Sandstone and Conglomerate unit 72, 73
 reef and lagoon sediments, Grande Terre 172–175
 reef complex 179–180
 reefal limestone 5, 68
 regolith 1, 3, 147, 177
 age 105, 155–157
 domed surface 263–264, 265
 geochemistry and mineralogy 152–153
 landforms 153–155
 surface 106, 162
 Reinga Basin 83
 reptile, fossils 196, 199, 200
 reptile, modern species 202
 reverse faults 121
 rhizcretions 160, 162–163, 165, 169–171
 rhodalgial biofacies 73
 rhodocrosite 260
 rhodolith 136–137, 199
 Rhodolith Limestone 134, 135–136, 139
Rhynochetos [cagou] iconic taxa 202–205
 rift and graben 84
 rifting, Gondwana margin 48–49
 rifting, Zealandia 192
 Rivière des Pirogues, prospect 253–255
 platinum group minerals 268–269, 271
 Rivière des Pirogues, road section 165
 rollback 14, 17, 19, 21
 root casts 152
- Saint Louis pluton 147–152
 age 157, 228
 granodiorite age 223
 mineralization 225
 Saint Louis, gold deposit 226, 228
 sand and gravel resource 232
 sand bar, Baie de Saint Vincent 171
 sand rose 171
 saprock/saprolite 258, 259, 262–263, 265–266, 268
 regolith development 152–154
 Sarraméa unit 38
 Saut du Guerrier 134
 scandium 247, 267
 -bearing ore 269
 sea spray, sulfur source 230
 sea-level curve 176, 195
 sea-level variation 137, 161, 169, 174–176
 seamount 14, 19, 43, 140, 141, 142
 benthic fauna 202
 Norfolk Ridge 168
 volcanic 196, 217
 sedimentary deposits, Grande Terre 158–168
 sedimentary exhalative stratiform sulfide (SEDEX) 216, 222–223, 238
 sedimentary log
 cover rocks 71
 Eocene cover rocks 69
 Fairway–Aotea basins 83
 Ilot Amédée 176
 Pindai Peninsula 161
- sedimentation rate, Eocene 79, 80
 seismic reflection 81, 83, 104, 122
 Lord Howe Rise 169
 Loyalty Ridge 138, 140
 offshore Grande Terre 167, 236
 Peridotite Nappe 115, 116
 Zealandia 19, 84
 seismicity 174, 180
 seismostratigraphy 192, 195
 serpentinite 76, 77, 78, 102, 119
 health hazard 232
 sliver 38–40, 43–44, 105, 123
 weathering 153
 serpentinite group 115
 serpentinite sole 105, 113, 120, 121, 177
 weathering 155
 serpentinitization 238
 and fracturing 114–115
 nickel mineralization 258, 260
 shear zone 110–111, 113
 sheeted dyke 123
 siderite 260
 silica-carbonate (listwanite) 149, 223–228, 236, 237
 siliciclastic deposits 168
 Grande Terre 158–162
 silicification 163, 217, 223
 silver deposits 217–218, 222
 sinkhole 137, 165, 262, 263
 in peridotite 153–156
 Quaternary 171
 slab 17
 break-off 5, 14
 Eocene subduction 178
 melt 85, 114, 120
 mineralization 228
 rollback 19, 62
 smectite 160, 162, 171, 176, 255, 260
 soft sediment deformation 73, 74, 78, 98
 sole *see* basal, metamorphic, serpentinite
 Sommet Khian 67
 South Loyalty Basin 84–85, 93–94, 119, 193–194
 sphalerite 219–220, 221, 222, 225–227
 spheroidal weathering 74
 spreading centre 13, 15, 17, 19, 20
 spreading rate 14, 21
 spreading ridge 5, 37, 110–112, 119–121, 190, 193
 stibnite 223, 224, 226–227
 strain variation 107
 stratigraphic marker 136
 stratigraphy
 cover rocks 63, 67–71
 Népouï Group 162
 Térémba Terrane 32, 36, 37
 stratigraphy, definitions and nomenclature 4–5, **foldout**
 subduction 62, 178–179, 193–194
 complex 42–43
 depth 104
 first use of term 93
 Mesozoic 14–17
 model 118–123
 Paleocene initiation 53
 polarity 19, 21, 190
 pre-Late Cretaceous terranes 45–49
 SW Pacific 13–22
 subduction–obduction 2
 assemblages 4–5 **foldout**
 mechanism 121–123
 Zealandia, Eocene 193–194
- Subduction–Obduction Complex, Eocene 93–96, 118–123
 geodynamic model 116–118
 HP–LT Metamorphic Belt 100–104
 Montagnes Blanche Nappe 96
 Peridotite Nappe 104–116
 Poya Terrane 96–98
 submergence–emergence, New Caledonia 195
 subsidence, offshore 179–180
 rate of 175
 sulfide deposit (massive) 57, 61, 84, 96, 101
 sulfide ore bodies 149, 217–226
 sulfur isotope ratio 230
 sulfur source, gypsum 171
 supergene deposits 248, 255–269
 ferruginous silica 160
 supra-subduction magmatism 114, 120
 survey, New Caledonia 3–4
 SW Pacific 46, 179
 evolution 18, 190–191
 tectonic map 46, 122
 syn-rift formations 56
- Table Unio, limestone 69–70, 79
 Tanlai barite resource 230, 231
 Taranaki Basin 81, 83
 hydrocarbons 235–236
 Tarouimba–Sphynx unit 35
 Tasman Frontier, database 236
 Tasman Sea 14–16, 82, 83, 84
 opening 119, 192, 195, 204
 seafloor spreading 45, 48
 tectonic model 1–2
 post-obduction 178–180
 pre-Late Cretaceous terranes 45–49
 tectonite 107, 109, 122
 tectostratigraphic assemblages 5
 tellurides 222
 tellurium mineralization 228
 Térémba Terrane 27–31, 32–33, 217, 238
 fossil record 197–198
 olistoliths 73
 tectonic reconstruction 46–48
 terraces, sea-level highstand 137, 175, 176
 terrane analysis 2–3
 terrane terminology, Grande Terre 93, **94–95**
 terrestrial environment 189–196, 198
 biota 199–205
 flora 197
 gastropod 169, 171
 recolonization 204
 emergence–submergence 195
 Tethys, affinity 29, 63, 197
 thermal maturation 59
 thermal relaxation sequences 83
 thermal subsidence 96, 193, 206, 217
 thermo-mineral springs 236–238
 thermobarometry, granitoids 149
 Thio unit 38, 267
 tholeiite 34, 36, 97–98
 Three Kings Ridge 141, 142
 seamounts 196
 thrust wedge 79, 80–81, 118
 Tiébaghi Massif 271
 Tiébaghi mining area
 chromite deposits 249–251
 nickel deposit 260, 262, 263
 Tiga island, phosphate 230, 231

- tin deposit 222
- Tonga–Kermadec arc–trench system 190, 195
- Tonga–Kermadec subduction 19–21, 84–85
- topography, post-obduction 177
- total organic content 56
- tourist site 134, 137
 Madeleine Waterfall 164, 165
- trace elements 36, 40–41, 43
 cover rocks 61, 62
 granitoids 150–152, 178
 Koné Facies 100
 Peridotite Nappe 112
 Térémba Terrane 30, 34
- trade winds 169–170
- travertine terraces 236
- tree trunks 33, 160, 164, 199
- tremolite 233
- Triassic, fossil record 196
- tungsten, mineralization 223, 224, 226–228
- turbidites 37, 65–81, 97, 176
 sedimentation rate 79, 80
- turtle, fossil 199, 200
- Uitoé Limestone 68, 70–73, 79, 81
 coralgall 198
- ultramafic rocks 120, 123
 aggregate source 232
 hyperalkaline springs 236–238
 laterite 165
 mineral resource 247–271
 Peridotite Nappe 104–116
 regolith 3
 weathering profile 152
- ultramafic soil, plant growth 201–202
- unconformity 53, 72, 84, 159, 160, 166
- Ile Hugon 33
- Late Cretaceous 27
- Miocene, Népoui Group 162
 post-obduction infill 83
- underplating 120–121, 149
- UNESCO World Heritage Protected Area 1, 232
- unroofing, Peridotite Nappe 116
- uplift and drainage 166
- Upper Bourail Turbidites 69, 74–75, 80
- Upper Népoui Formation 159, 160–161
- Vanuatu 14–16, 19, 21
 arc-trench system 138–140, 141, 190, 196
 convergence zone 138, 139
 forebulge 136–138, 139
- vertebrate fossils 29, 199
- vertisol 171, 229–230
- vicariance 189–196, 198, 204–206
- volcanic arc 13
 convergence 142
 Mesozoic 17
- volcanic lithologies 28–29
- volcanic rocks, aggregate source 232
- volcaniclastic lithologies 29, 37–39, 42, 56
 geochemistry 30–31, 34
 zircon age 45–46
- volcanogenic massive sulfide 216, 217–223, 238
- volcanism, intra-plate 168, 169
- Wadjana hanging valley 174, 179
- Wajakac sinkhole 131, 134
- Walpole Island, phosphate/collophane 230, 231
- wave-cut palaeo-erosion 168
- weathering 161, 163, 165
 continental 194
 mineral concentration 247
 rate of 153, 157
 and uplift rate 154, 264, 266
 weathering profile 152, 153–157, 252, 255
 platinum group minerals 268
 process and nomenclature 258, 259–260
 scandium 269
 thickness 262
- wehrlite 107, 110, 247, 253–255, 269
- wells *see* boreholes
- 'West Caledonian Fault Zone' 178, 203
- Whitsunday large igneous province 46, 48
- wildflysch 75, 79
- xenolith 113, 149
- Yaté, catchment capture 166
- Zealandia 1–5, 13–17, 18, 21, 46, 131
 Late Cretaceous–Eocene 81–85
 marine sediments 168
 subduction/obduction zones 116–118, 123
 tectonic history 189–196
 tectonic model 178
 terrestrial biota 205
- zeolite 61, 76–78, 96
- zinc deposit 220–223, 222
- zircon *see also* detrital zircon
 zircon age, U–Pb 35, 45, 104, 114, 139
 basement 38–39
 cover rocks 57, 59–60, 82