

Index

Note: Page numbers relating to figures are denoted in *italics*, page number relating to tables are in **bold** type.

- accretionary wedge 85, 112, 211
African plate 255–284,
256–257, 279, 282, 355
- Afrin fault 281
- Agua Blanca fault 148
- Aj Bogd 229
- Akato Tagh bend 58, 100, 107
- Akkar fault 289
- Aksu Plain 258
- Aktepe neck 262–263, 273
- Alleghean–Ouachita Orogeny 112
- Alpine fault 87–90, 88, 90,
96–97, 99
- Alpine–Carpathian Orogen 96–97,
99, 419
- Alps
kinematic evolution 352–355
present day activity 355–356
regional geology 351–356
regional kinematics 362
seismicity 355
stratigraphy 351–352, 353
structural map 352
- Altai 100–103
bend structure 221, 225,
226–227, **228**
fault systems 221, 235
geology and active tectonics
220–225, 232
restraining bends 219–237, 223
- Altyn Tagh fault 58, 100, 107
- Amanas fault 256–257, 262–263,
264–265, 272–273, 280
- basalt samples 259, 260–261,
274
- kinematics 255–284
offset basalt flows 255–284
partitioned slip 275–276
slip rates 255, 258, 266, 269, 270,
271, 280–282
- splays 275
- topography 259, 274
- vertical slip 258, 276–277, 278,
283
- Amanos Mountains 7, 255, 256–257,
271, 277–278, 280
- asymmetry 276–278
- cross section 260
- development 257–258, 277
- fold orientation 277, 278
- isostatic balance 279
- shortening factor 278–279
- uplift rates 278–279, 283
- Amik Basin 258
- analogue models 4, 50–51, 55, 61,
143, 162, 165, 305–306,
320–321, 320, 345, 346
- Anatolian Block 92, 95
- Andaman Sea 107
- Anger-rét Mine 422, 426
fault overlaps 423
stereograms 425
stress regime 426
transtensional relay ramp 422, 423
- angle of convergence 382–383, 384
- angle of divergence 433, 434, 434,
435, 436, 437, 443
- Antarctic plate 204
- Anti-Lebanon Range 280, 285,
287–289, 290, 299
- apatite fission track 60, 325,
329–331, **332**, 334, 335
- Appalachian Mountains 37
- Ar Hötöl fault 229
- Ar/Ar dating 255–284, **266**, 267,
282, 331, 334, 456
- Arabian plate 97, 255–284, 256–257
motion 103, 279, 282, 286, 287,
294, 301
- Arbuckle Mountains 105, 114
- arcuate trench linked faults *see* trench
linked faults
- Ardmore Basin 105, 114
- Arica bend 109
- Armanaz fault 282
- Artz Bogd fault 388, 389
- Atacama fault 109–112, 118
- Australian plate 389, 390
- motion 87, 90, 410, 410, 411
- Avalon terrane 367
- Ayutthaya Basin 317, 318
- Ayutthaya-Ban Klong Pong fault
311, 320
- Baga Bogd 224–225, 225–227
- Bahama Bank 39
- Bahama carbonate platform 82–83,
83, 84, 244
- Bam earthquake 100, 105
- Banning Fault 194, 197
- Barshin volcano 37
- Bartlett Springs fault 67
- basalt 281–282
crustal motions 265–276
dating 260, 265–276
eruption date 270, 271
fractional crystallisation 270
geochemical analysis 255,
261–265
geomagnetic polarity 276
offsets 255, 270, 271, 276
partial melting 270
source 261–263
stratigraphy 263
- basement *see* pre-existing structures
- basins 5–6, 319, 345
boundary fault 152
Cenozoic basin models 307–309
Cenozoic basins 338–340
coalescing 45
cross basin faults 122
deeps 46
evolutionary model 35–36
extinction 122
formation 2, 50
geometry 45, 51, 63
inversion 4, 45, 46, 163, 164,
165, 317–318, 318,
321, 345
sedimentation 47, 155
spindle shaped 68, 87
termination basins 38
transcurrent fault zone 203–217
see also pull apart basins;
rhomboidal basins
- bathymetry, multi beam swath 5,
145–147
- Bayan Tsagaan Uul 227
- Bekaa Valley 287, 291
- Bering Sea 116, 123, 124
- Bhumipol Dam, gneisses 331
- Big Bend, California 194
mixed mode 59
regional fault patterns 68
strain partitioning 294–295
- Black Hills restraining bend
116, 124
- Blanco transform 62, 63
- blocks
rotation 180–181, 285
rotational velocities 410–411,
410
strain rates 408
velocity vectors 407, 407
- Blue Mountain fault 80
- Blue Mountain restraining bend
seismics 245
slip accommodation 247
uplift 248, 249
- Blue Mountains 83, 239, 249
- Bocono fault 92, 93
- Bogd fault 220, 224–225, 225, 227
- boreholes, mining exploration 373
- boudinage 367, 376–380, 380,
383, 384
- Bouguer gravity map 49, 338
- boundary faults 54, 362, 391, 433
- Bovey Basin 97, 102
- Bransfield Strait 206
- Brawley-Imperial fault 35–36
- brecciation 422, 428, 440

- British Isles 102
 bends 97
 rhomboidal basin 101
see also England
- Brunhes chron 269
- Büyük Aktepe basalt 261, 263, 275–276
- Büyük Höyük basalt 263, 273
- bypass faults 53–54, 68, 96, 123, 126, 243, 249, 250
- Calaveras fault 60, 67, 190, 193
 seismicity 193, 196, 198
see also Hayward-Calaveras fault
- California 35–36, 52, 56, 194
 pull apart basins 70
see also California Borderlands;
 Eastern California Shear Zone; Northern California; Southern California
- California Borderlands 69, 144–148
 basin inversion 164–165
 bend morphology 148–155, 165
 Big Bend 194
 data 145–148
 oblique rifting 163–164
 paired bends 69, 69
 plate motion 69, 164–165
 regional bend patterns 68–69
 restraining bends 143–168
 seafloor morphology 144–145
 sediments 147
 seismic profiles 147
 spreading centre 163–164
 transform faults 163–164
- Camp Douglas 447, 448, 450, 462, 470
 hydrothermal activity 466
 magnetic susceptibility 466, 466
 mineralization 469
 striations 454
 tectonics 467
 volcanism 466
- Canadian Appalachians 367–385
 boudinage 376–380, 382
 cleavage 380–381, 382
 fault propagation 371
 faults and fractures 381–382
 folds 371, 373–376, 382
 intrusions 371
 Little Rainy Cove 375
 map scale structures 370–373
 outcrop scale structures 373–382
 Rainy Cove 375, 377, 378, 379
 regional geological setting 367–369
 rotation 381, 384
 strain history 383
 stratigraphy 369–370
 structure orientation 372, 374, 376, 377, 381–382
 subsurface structure 373
 tectonic units 368, 382
- transpressional structures 367–385
 Walton 375–376, 379
- carbon isotopes 316, 316
- carbonates 176, 314–315, 315
- Cariaco Basin 84
- Caribbean fault 76–77, 77–80, 79, 241
 GPS surveys 80
 N America 80–84
 S America 84
 tectonic setting 77–80, 78
 topography 78
- Caribbean plate 6–7, 84, 240–243, 241
 first-order deformation pattern 245–247
 GPS results 245–247
 motion 76–77, 77–80, 78, 80, 81, 243, 247
 pole of rotation 245
 velocity field 245–247, 246
- Caribbean-North America-Gonave plate motion 243
- Catalina Basin 158, 158
- Catalina fault 143, 155, 158, 163
 PDZ structures 157–158
 seismicity 159
- Cayman Trough 46, 77–80, 79, 83, 242–243, 243, 247
- cementation 435, 440
- Central American Arc 113, 121
- Central Basin 305
- Cerdanya clastic basin 38
- Cerro de la Mica 118
- Cerro de Mica, Z-restraining bend 110
- Ceyhan Gorge 277–278
- Ceylanlı basalt 273
- Chainat duplex 305–323, 311, 319, 325, 326
 adjacent basins 317–321
 analogue models 320–321, 320, 345
- Cenozoic basins 309–312, 318–320, 319, 338–340
- Cenozoic subcrop map 309, 313
- cooling age traverse 333–337
- deformation episodes 305–323, 319
- erosion 343
- exhumation history 336, 338–340
- exiting bend 325
- fault geometries 309–313, 312
- fault location evidence 309
- fold geometry 309
 geological background 306–309
 granite intrusions 343
 immaturity 321, 344, 345
 internal geometry 320
 magnetic data 309, 310, 312
 outcrop geometry 309, 310, 312, 313–316
- reactivation 321, 346
 stratigraphic wells 309, 312, 313
 stress regime 321, 345–346
 strike slip model 309
 tectonic history 318–320
- Chainat Ridge 306–307, 309, 329, 340
 carbonates 314–315, 315
 displacement evidence 316
 folds and thrusts 314
 foliation 314, 315
 fracture orientation 315
 geology 307, 314
 slickensides 315, 316–317
 Triassic granite 315–316, 315
- Chandiman Uul 227
- Charleston earthquake 120
- Chile 109–112, 117, 118
- China 47, 100–103, 108, 219–237
- Cholame Valley 191–192, 193, 198
- Claremont chert 176
- Clarence fault 405
- Clear Lake basin 67
- Clipperton transform, transpressional ridge 63
- Clonard pull apart basin 35–36
- Coast Range basement 171
- Coastal Scarp, Chile 109
- Cobequid fault 37
- Cobequid–Chedabucto fault
see Minas fault
- coefficient of internal friction 435
- coefficient of sliding friction 435
- Colombia 92
- Columbia Mountain fault 453, 462, 469
- Comstock fault 452, 453–454, 453, 455, 459, 461, 462, 468
 hanging wall 459, 460, 461
 inversion 469
 transpression 460
- Comstock stepover 469
- Concord fault 178
- connecting faults 425, 427–428, 428–429
- continental collision 90–105
- contractional duplex *see* restraining bends;
 stepovers
- cooling age data 325, 329, 330
- Coronado Bank fault 159, 160
- Coronado canyon, fan valley 161, 161
- Coso Basin 71
- Coyote Creek fault 52, 55, 56
- Coyote ridge basin 37
- Crackington Haven fault termination 388, 389
- Crawle River fault 247
- Crespi knoll 160
- crossing faults 122, 251, 356–358

- crust
 heterogeneity 144
 lower crustal flow 338
 mass balance 58, 71, 123, 278–279
 oceanic crust 63
 rheology 203, 213–214, 215, 233, 412
 thermally weakened 164
 thickness 2, 207
 Cuddy Saddle fault 53, 54
- Dasht-e-Bayaz earthquake 97, 104
 Dasht-e-Bayaz fault 97
 Davidson Granodiorite 452, 455, 468, 469
 Dayinshui Basin 108
 Dead Sea Basin 37, 45, 46, 74, 77, 183–184, 321
 Dead Sea fault 37, 44, 55, 56, 255, 258, 277, 285–303
 active faulting 289–294
 bends 74, 280
 Bouguer gravity mapping 49
 earthquakes 289
 geological development 72–74
 geometry 279
 GPS 74, 75, 288
 Homs basalt 281–282
 left lateral slip 73, 282
 Northern 75–77, 257
 paired bends 75
 phased evolution 73, 75–77
 regional kinematics 280–282
 shear 288
 slip rate 7, 74, 282
 Southern 74
 splays 74, 285, 289
 strike 279
 tectonic setting 72–74, 73, 286, 287–289
 transpression 279, 280
- Death Valley 45
 Z-shaped pull apart 71, 72
- décollement horizon 50–51, 373, 382
- deformation 7, 389, 428
 basin fill record 144
 coupled fluid flow 448–449, 450, 459, 469–470
 depth 60, 144, 193–194, 439
 extensional 203–217
 finite 381
 overprinting 375, 376, 379
- Descanso Fan Valley 154
 Descanso Plain 148, 148, 153
- digital elevation model (DEM) 58, 222, 223, 390
- dilational jogs 442, 442, 443
- dilational stepovers 434, 437
 3D model 442–443
 deformation pattern 437
 geometry 437–438
 permeability 441–442
 progressive deformation model 443
- strain field 437
 strike slip 434–435
 structural evolution 433–445
- dip-slip displacement 1, 4, 7–8, 387
- Discovery Bank 203, 204, 206–208
- deep basin 207, 208, 208, 214, 215
- free air gravity profiles 209
- seismicity 208, 208, 210, 214
- Doi Inthanon metamorphic core complex 329
- Doi Suthep metamorphic core complex 329
- Doruneh fault 388, 389
- double bends *see* paired bends
- Duanvale fault 247, 248
- dykes 8, 315, 356, 358, 439, 440, 441, 441, 453, 468
- earthquakes 2, 14, 65, 120, 144, 157, 189, 194, 245, 250, 251, 319, 355–356
 epicentres 118, 196
 hazards 5–6, 301
 intraplate 116
 propagation 2, 6
 recurrence 120, 257
 see also focal mechanisms;
 hypocentres;
 rupture zone
- East Anatolian fault 95, 96, 277
- East Hatay fault 255, 256–257, 280, 282, 283
 slip 276–277, 281
- East Pacific Rise 62, 63
- Eastern California Shear Zone 198
- Eastern Vértes Ridge 418, 421
- Edgecumbe fault 391
- El Pilar fault 84
- El Salvador fault 113
- elastic properties 434
- elastic strain
 accumulation 247
 modelling 435
- England 388, 389, 438–440
- Enna fault 354–355
 Gamonda fault 356–357
- Enriquillo-Plantain Garden fault 35–36, 83, 239, 241, 248
- erosion 4, 52, 143, 329
 rates 4, 219, 235
- Euphrates fault 287
- Eurasia 97, 103, 113, 355
- Eurasia Orogeny 112
- European foreland faults 96–97, 98
- Excelsior Mountains 462, 469
 geology 465
 magnetic susceptibility 466
 reverse faults 466–467
 striation data 466
- extension
 dominated domains 438–439, 439
 dominated transtension 435–436, 436, 438, 442, 443
- rates 407, 429
- rift orthogonal heterogeneous 387, 407, 411, 412
- uniform extension model 47
- extensional duplex *see* releasing bends; stepovers
- fault bends 1, 4, 5, 16, 55, 143, 144, 153, 232
 indent linked faults 90–105
 morphology 153–155
 oceanic transform boundary fault 61–63
 plate boundary faults 63–90
 scale 144
 shear zone model 55
 trench linked faults 105–107
 type and location **18–33**
 see also paired bends; relay zones; releasing bends; restraining bends; stepovers
- fault segments 153, 417–431, 449
- fault splays 1, 8, 54, 55, 74, 84, 87, 328, 351, 356–358, 387, 406, 421, 425, 428
- fault termination 1, 3, 7–8, 81, 81, 163, 219, 232, 388–389, 405–410, 411, 422
 basin 36
 end member models 406
 free tip 387, 388
 mechanisms 387, 412
 rotational 387, 388, 412
 three plate geometry 388–389, 388
 two plate geometry 387–388, 388
 types 387–389, 388
- fault-fracture mesh 433, 434, 437, 437, 440, 441, 443
- faults 1, 4, 6, 44, 63, 67, 71, 121, 123, 144, 189, 219, 325, 389, 417
 abandoned 55, 121, 181, 220, 235, 470
 antithetic 351
 bifurcation 389, 399, 406, 408–410
 co-dependence 251
 coherent array 417
 connectivity 2, 417, 429
 cratonic 116–120
 depth 6, 196, 316
 dip 147, 152, 163, 417, 421
 dormancy 184
 en échelon 1, 162–164, 164, 165, 417
 evolution 449–468
 geometry 3, 153–155
 hard linked 418, 421
 hydraulic conduction 447
 inversion 425–426, 425, 426, 429, 430, 469, 470
 left lateral 45, 52
 lenses 54

- faults (*Continued*)
 locked 247
 lower crust 344
 misoriented 449
 offsets 1, 3, 34, 45, 46, 52, 89, 147
 orphaned 470
 progressive displacements 4, 234
 propagation 144, 181, 184, 371
 reactivation 3, 7, 8, 55, 116, 124, 219, 233, 305, 351, 353, 362, 437, 442
 right lateral 45, 52, 143
 rotation 406, 412
 separation 34, 41, 45, 46, 53, 417
 stress field 417, 429
 strike 41, 68, 417
 terminology 16–34
 through going 434, 435
 trace 6, 67, 120, 124–125, 163
see also boundary faults; bypass faults; connecting faults; crossing faults; horsetail faults; indent linked faults; intraplate faults; master faults; normal faults; reverse faults; secondary faults; short cut faults; strike slip faults; thrust faults; trench linked faults
- finite element modelling 55
 fission track dating *see* apatite fission track; zircon fission track
 flower structures 1, 6, 7, 114, 154, 163, 192, 219, 227, 229, 230, 233, 374, 382, 382, 383
 fluid flow 7–8, 433, 442, 447, 469
 coupled deformation 448–449, 450, 459, 469–470
 focal mechanisms 84–85, 87, 113, 118, 159, 192, 195, 213, 245, 354–355
 folds 362, 363, 367, 371, 378, 383, 438, 440, 470
 axes 455, 468
 box 362
 chevron 362
 detachment 375
 en échelon 1, 96, 113
 fault propagation 381
 geometry 373–375
 hinge trends 375, 376
 interpretation 379
 orientations 439
 parasitic 375
 refolding 367
 relationships 383
 rotation 373
 scale 373, 375
 thrust belts 7, 52
 fore-arc sliver 105, 107, 110, 113, 119
 Fort Tejon earthquake 191
 fractional crystallisation 263, 270
 fracture
 aperture 449
 connectivity 433, 449
 density 449
 mesh 8, 434, 435, 439–442
 permeability 447, 448
see also hydrofractures
 Franciscan Complex 170–171
 Fu–Yun fault 230
 Galatea Basin 400
 Gamonda fault 351, 354–355, 356
 Enna fault 356–357
 geometry 362
 splays 358, 362–363
 termination 357
 throw 358
 Gamonda–Tormeno stepover 351, 356, 357, 362
 3D reconstruction 364
 cross section 358, 359
 cross-cutting conjugate planar fault model 358
 digital elevation model 360–361
 eastern subzone 362, 363
 fault slip data 356
 polyphase evolution 356–362, 360, 363, 364
 western subzone 362, 363, 363
 Gánt mining area 418, 419
 characteristics 418–422
 fault patterns 421
 geological setting 420–421
 slickensides 420–421, 421
 stress field 420–421, 426
 structures 418–425
 Geological Society of London 4
 Gesztes fault 419
 Ghab Basin 37, 75–77, 282
 Glynn Wye Lake basin 35–36
 gneiss 325, 328, 329, 331, 333, 333, 336, 337, 340–346, 342–343
 Gobi Altai 109, 235
 basin and range 220
 bend structure 224–225, 225, 228
 fault systems 221
 geology 220–225
 restraining bends 103, 219–237, 222
 tectonic setting 220–225, 232
 topography 221
 Gobi–Tien Shan fault 109, 229, 230
 Golden Gate fault 176
 Goldfield 447, 448, 452, 457, 458, 462, 470
 alteration 469
 displacement 450–459
 extensional stepover 463, 464
 faults 450–459, 453, 461, 462, 463, 464
 magnetic susceptibility 458–459, 458
 mineral exploration 464, 469
 striation data 458, 458
 volcanism 450–455, 457, 468
 Gonave microplate 80, 81, 82–83, 83, 243, 244, 244, 247
 Gorda Ridge 62, 63
 Gowk fault 100
 GPS 7, 147, 244, 287–289, 398, 400, 406
 plate kinematics 65
 velocities 244, 245, 407, 407
 grabens 152, 276, 354–355, 358
 granite, Triassic 315–316, 315
 gravity inversion 194
 Great Glen fault 97
 Greece 405
 Green Valley fault 178
 Greenville fault 178
 Griffith Coulomb failure envelope 435
 guided slip 8, 417, 429, 430
 Gulf of Paria Basin 84
 Gulu fault 103
 Güzelce fault 259, 273–275
 Hacilar basalt 264–265, 265–266, 269, 272–273, 276
 Hacilar River offset 265–266, 272–273
 Haiti 35–36, 81, 83–84
 Haiyuan fault 47, 103, 108
 Hammer Basin 87, 89
 Har Us Nuur fault 226–227, 230
 Hassa basalt 266–269
 Hatay ophiolite 262–263, 281
 Hayward fault 37, 60, 190, 191, 192
 Hayward–Calaveras
 earthquake 198
 stepover 178, 184, 190–191, 191
 Hespérides Basin 215
 Hikurangi margin 389, 410
 Himalayan escape tectonics 345
 Himalayan Orogeny 306, 309
 Hispaniola 82–83, 243, 244
 restraining bend 39, 84, 243, 294
 Hjort trench, bends 90
 Hollow fault 37
 Hope Fault 35–36, 44, 89
 horsetail faults 36, 357, 406, 421, 459
see also fault splays
 Hungary, Pannonian Basin 417–431
 hydraulic conductivity 449, 449
 hydraulic implosion 440, 442
 hydrocarbons 2, 3, 97, 144, 219, 351, 433
 hydrofractures 434, 435
 hydrothermal
 activity 453–454, 462, 469, 470
 alteration 459, 468–469
 deposits 8, 433
 discharge rates 448
 fluids 433, 469

- hypocentres 6, 192
 double difference relocated
 seismicity 189, 192, 193,
 193, 194
- Icoatea Basin 92, 94
- Ih Bogd 224–225, 227
- indent linked faults 5, 13, 15, 40, 54,
 90–105
- Indo-Eurasia collision 100, 220
- Indonesia 107–109
- Indosinian Orogeny 308, 314
- Inner Borderland Rift 163
- InSAR 65, 67
- Inthanon zone 307, 308, 328
- intraplate faults 5, 13, 15, 116–120
- intrusions 315–316, 315, 438, 462
- Investigator fracture zone 109
- Iran 103, 388, 389
- Iranian Plateau, bends 97–100
- Italy, SE Alps 351–366
- Izmit earthquake 194
- Jabal Nusayriyah stepover 280
- Jamaica 6–7, 81, 241
 crustal thickness 244
 earthquakes 239, 243, 244, 245,
 251–252, 251
 GPS velocity field 239,
 247–248
 liquefaction 245
 paired bends 83, 242–243, 248
 tectonic models 247–248
 topography 80, 242–243
 tsunamis 243
 uplift 244, 248
 see also West Jamaican releasing
 bend
- Jamaican restraining bend 58,
 239–253, 250
 cross fault relays 251
 geological setting 243–245
 seismicity 244
 tectonic setting 243–244
 topography 83
- Jane Basin 204, 210
- Jaouz anticline 296–297, 301
- Japan 110–112, 119, 194
- Jargalant Nuruu 230
- Jargalant Range 226–227
- Java Trench 107
- Jebel Abdel Aziz 287
- Jhar fault 294
- Juan de Fuca Ridge 62, 63
- Kalecik Tepe basalt 266
- Karacağil basalt 271–273
- Karaelma basalt 276
- Karaloram fault 100–103
- Karasu Valley 255, 256–257, 258
 digital elevation model 257
 earthquake recurrence
 279–280
 en échelon faults 257
 geology 258
 morphology 260, 276
 predicted slip 281
- Karasu Valley basalts
 Ar/Ar dating 266, 282
 geochemistry 261, 263, 268,
 269, 282
- Karlik Tagh Range 220, 224–225,
 230
- Keltepe basalt 261, 264–265
- Kermadec Trench 87
- Kesmeli Tepe basalt 264–265, 266,
 276
- Khlong Lhan Gneiss 333, 336, 343,
 345
- Khlong Lhan restraining bend 7, 305,
 308, 311, 320, 321, 333,
 342–343, 346
- Kisik Tepe basalt 261, 264–265, 271
- Kobe earthquake 112, 120, 194
- Kocaören basalt 272–273
- Küçük Höyük neck 262–263, 273
- Küreci basalt 263, 269–271, 275
- Kurile Arc 110–112, 119
- La Gonzalez gentle releasing bend
 92, 93
- La Tet fault 38
- Lahan graben 318, 318, 336–337,
 344
- Lake Baikal Basin 45, 105, 110, 111
- Lake Meced 194
- Lake Mountain fault zone 67
- Lake Singkarak pull apart 116
- Lake Tahoe Basin 71
- Lan Sang Gneiss 325, 328, 342–343,
 345
 Cenozoic basin contact 343–344
 cooling ages 333, 340, 346
 exhumation history 331, 336,
 337, 343
 extensional collapse 344
 foliation 329
 geometry 328
 outcrops 340–343
- Landers earthquake 194
- Laramide Orogeny 105, 112, 113
- Laramie Basin 113
- Lausen Knoll 159, 162
- Lebanese restraining bend 7, 58, 59,
 74–75, 75, 77, 277, 279, 280,
 285–303
 block rotations 61, 285
 cross section 289
 development 299–301
 fault slip rates 290
 finite deformation 299
 geometric model 294, 295
 kinematic model 294–295
 polyphase evolution 285, 300, 300
 predicted shortening 300
 strain partitioning 285
 topography 288, 297
 wrench faulting 285
- Lebanon
 climate history 294
 earthquake 297
 Mountains 59, 280
 paired bend 56
- Liquire–Ofqui fault 109
- Little Lake Valley basin 67
- Little Sulfur Creek basin 67
- Loma Prieta restraining bend,
 migration 185
- Maacama fault zone 67
- MacDougall Ridge 91
- Macquarie fault 90, 91
- Macquarie Ridge 39, 52, 87–90,
 88, 91
- Mae Lamao Basin 338, 342–343, 344
- Mae Ping fault 7, 105, 305–307, 306,
 327, 328–329, 336, 337, 345
 age data 329–331
 cooling history 331, 337, 341
 deformation evolution 325–349
 dextral motion 317, 327–328,
 331
 estimated slip 321
 evolution model 346
 outcrop patterns 329, 340, 341
 reversal 317, 327–328
 sinistral motion 317, 325, 327,
 331
 structural evolution 340–344,
 341, 342–343
 tectonic history 318–320, 319
 trend 307, 309, 310, 326–327
 uplift and erosion 333, 340
- Mae Sariang metamorphic core
 complex 337–338, 346
- Mae Sariang splay 307
- Mae Sot Basin 328, 338–339,
 342–343, 344
 inversion 339
 seismic line 339, 339
- Mae Tuen coalfield 339–340
 geothermal gradients 339
 normal fault 343–344
- Magdalena Basin 47
- magma chemistry 450, 455, 469
- Malga Zolle fault 356, 357–358,
 362, 363
- Maracaibo Basin 92, 94
- Maracaibo Block 93
- Maritimes Basin, stratigraphy 368
- Marlborough faults 87, 89
- Massif de la Macaya 81, 83
- master faults 34, 233, 428
 geometry 44
 migration 47
 and oblique zone 305
 parallelism 44, 45, 46
 separation 55
 slip rate 219
 slip reversal 46
 tip propagation 46
 underlap 44

- master faults (*Continued*)
 valleys 52–53
 see also principle displacement zone
 Matata fault 391
 Matuyama chron 271–273
 Median Tectonic Line 112, 120
 Meguma terrane 367
 Mendocino triple junction 65–67, 171, 178, 179–180, 180, 184
 Mengilydyk Nuruu 226–227
 Mengilydyk Uul 229
 Merced Formation 176–178, 177, 181
 age 181
 bi-directional wake 183
 deposition 176, 177
 inversion 176
 Mesquite playa basin 35–36
 Mid-Cayman spreading centre 241
 Mid-Hungarian shear zone 418, 419
 Middleton Place-Summerville seismic zone 118–120, 125
 migrating stepovers 6, 8, 169–188, 450–459, 468, 469, 470
 characteristics 170, 170
 end members 182–183, 184–185, 186
 fault tip propagation 170, 184
 mechanisms 180–184, 185–186
 migration rate 178, 181
 models 180–186
 principle displacement zone 169
 structural relief 170, 178
 tectonic inversion 169, 170
 see also wake
 Miller Creek fault 173–176, 174, 175, 181
 Millerton Formation 172
 Minas Basin 367, 369, 370
 Minas fault 367, 368–369, 383
 mineral deposits 2, 3, 8, 219, 351
 volcanic centre related 447–471
 mineralization 373, 468
 fluid source 316–317
 temperature of 316
 Mission Hills restraining bend 60, 67
 Mohaka fault 399, 401–402, 408
 Moho discontinuity 207, 287
 Mohr diagram 435
 Mongolia 103, 109, 219–237, 388, 389
 see also Altai; Gobi Altai
 Montagua fault zone 83
 Montpellier Rift 242–243, 251, 251
 Morena Ridge 453
 Motagua fault 39, 80–83
 Mount Diablo stepover 178–179, 179
 Mount Lebanon Range 287–289, 290, 291
 crustal root 287
 folds 287, 294, 296
 rotations 299
 shortening 285, 295–296
 uplift rate 297–299
 Mount Tormeno fault 360–361
 mountain building process 6, 219, 235
 Museum fault 422–425
 geometry 424
 overlaps 424, 425
 relay ramp 424, 425
 slickensides 422
 stereograms 425
 stress regime 426
 Nagykovácsi fault 419
 Navarin restraining bend 124
 Navarin South pull apart 124
 Navy Fan 154, 154, 156
 Nemegt Uul 224–225, 229
 Nevada 447–471, 448, 450
 New Madrid, USA 118, 125
 New Zealand 35–36, 44, 87, 88, 91, 387–415, 390
 displacements 398
 fault geometry 387, 392–397, 398
 kinematics 392–397, 410–411, 410
 slip vectors 387, 398
 tectonic setting 389–398
 tephra analysis 398, 398–399
 Newport–Montpellier rift 248
 Niskar pull apart basin 35–36
 Nojima–Rokko fault system 194
 Nong Bua sub-basin 318
 normal faults 8, 45, 50, 331, 353, 363, 367, 382
 basin controlling 49
 conjugate 358
 erosion 383
 inversion 298, 362, 363
 oblique 155
 rift parallel 405
 North America
 mid-continent 105, 112
 plate boundary segmentation 449
 plate motion 65, 76–77, 78, 80, 81, 240, 241, 243, 244
 North Anatolian fault 35–36, 52, 55, 95, 96, 194, 406
 bends 92–96, 95, 96
 North Island Fault System 387, 389, 390, 390
 differential extension 404–405, 407, 409
 fault data 389–398, 399
 kinematic boundary 405
 rift orthogonal extension 405
 slip rates 389–390, 390, 391, 410, 410
 slip ratio 404, 405
 slip vectors 399–404, 408, 409, 412
 splays 389, 391, 408, 412
 Taupo Rift 389, 404
 tectonic setting 389–398
 termination 391, 399–405, 400, 401, 408, 412
 North Palm Springs earthquake 197, 198
 North Sea 96–97, 101
 Northeast Georgia Rise 87
 Northern California
 paired bend interpretation 67–68
 regional fault pattern 65, 67–68
 San Andreas fault 66
 slip parallel region 65–68
 Northern Central America
 paired bends 243
 restraining bend 80–83
 Northumberland Basin 438, 439
 deformation patterns 438
 Dunstanburgh Castle 440
 fracture-mesh development 439–440
 geological setting 438–439
 transtensional deformation 438–440
 Norwegian basins 48
 Nova Scotia 37
 NW South America fault system 92, 93

 oceanic transform faults 5, 13, 40, 63
 bends 61–63, 124
 Oceanside, earthquake 157, 159, 160
 Ocotillo badlands 39, 52
 Ocotillo restraining bend 56
 Oklahoma aulacogen 114
 Olduvai subchron 276
 Olema Creek Formation 172, 173, 181, 182, 184–185
 Ona Basin 210–211
 ophiolites 52, 270
 ore bodies 433, 454, 462
 formation 447
 geometry 469
 grade 469, 470
 permeability structure 449
 Oriente transform fault 241, 244
 orogenic belt 6, 96, 234, 345
 termination zone 230
 Owl Creek fault 113
 Owl Creek restraining bend 105
 oxygen isotopes 316, 316

 P-shears 55, 57
 Pacific Margin Anomaly 208
 Pacific plate 240, 389, 390
 motion 65, 67, 87, 90, 410, 410, 411
 subduction 110, 119
 Pacific-North America plate boundary 144, 152, 162
 relative motion vector 163–165, 170
 paired bends 1–3, 5, 13–14, 15, 34, 54–55, 56, 61–64, 121, 148, 241, 417
 basement controls 58

- dating 122
 evolution 71, 125
 fault trace 240–243
 models 57, 123, 249
 morphology 152
 structure 152
- Palawan Block 113
- Palmyrides fold-thrust belt 77, 287, 294, 295
- Palos Verdes Hills 152, 157, 159
 fault 157, 159–160, 160, 165
- Pannonian Basin 418, 419
 transtensional transfer zones 417–431
- Pannonian plate 96
- Parkfield 191–192, 193, 194
 earthquakes 191, 198
- partial melting 263, 270
- Pei Ta Shan 230
- peneplain remnants 229–230, 232
- Peninsula San Andreas fault 181
- Peninsular Ranges faults 153
- Periadriatic fault 419
- permeability structure 8, 433, 435, 443, 447, 448, 449, 462, 469, 470
- Petrokstorm Basin 97
- Philippine fault 113
- Philippine Sea 113
- Philippine Trench 113
- Philippines, tectonics 122
- Phitsanulok Basin 325, 337, 344
see also Southern Phitsanulok Basin
- Phoenix plate 203
- Pijnacker oil field 97, 100
- plate boundary
 geometry 51–52, 257, 435
 motion 3, 6, 61–63, 66, 87, 164
 strike slip fault bends 63–90, 164
 strike slip faults 5, 13, 15, 54
 structural blocks 449
 transform faults 4, 40, 164, 165
- plate reconstruction, rigid block translations 340, 405
- pole of rotation 5, 13, 41, 44, 52, 63, 64, 65, 68
- Polochic fault 39, 80–81
- pop up structures 143, 144, 162, 162, 163
- pore pressure 435, 441–442
- Potter Valley basin 67
- Powell Basin 204, 208–209, 210, 213, 215
- pre-existing structures 5, 6, 14, 122, 124, 155, 233, 235, 243, 289, 307–309, 328, 351, 363, 438
 extensional 353–355, 355
 reactivation 83, 116, 161, 219, 239, 433, 441
 stress concentrators 120, 123, 321
- pressure ridge 169
- principle displacement zone 1, 34, 63, 124, 143, 148, 152, 153, 160, 169
 connections 305
 double bump 161, 163
 paired 184
 predicted uplift 178
 propagation 170
 strike 163
 surface expression 193
 vertical dip 154
 wake length 181, 184, 185, 186
- Protector Basin 210–211
- Puerto Rico 82–83
- pull apart basins 15, 34, 62, 67, 87, 148, 153, 164–165, 245
 analogue models 40, 50–51
 at depth models 50
 block rotation model 48–49
 complexities 47, 48–49
 continuum models 40, 41–48
 development 44, 121–123
 earthquake rupture models 50
 en échelon 5, 13, 55, 68, 74
 evolutionary model 37, 41
 extreme 46–47, 83
 fault controlled subsidence 49
 geophysical imaging 49–50
 heat flow 47
 inversion 172
 magmatic settings 4, 48
 morphology 2, 45, 68
 numerical models 51
 outcrop scale 50, 53
 preservation potential 47–48
 reinterpretation of 48
 relative plate motion 41–44, 42, 43
 rhomboidal 37, 44, 45–46
 rotational strain 49
 scale 40, 44
 sedimentation 45, 49
 sharp 45
 spindle 35–36, 44
 structural model 198–199
 synonyms 34–36
 tectonic settings 122
 theoretical models 40
 thermal modelling 47
 transform normal extension model 48
 type and location 18–33
 within larger basin 71
- Punchbowl fault zone 53, 54
- Purang fault 100, 105
- pure shear 7, 52, 367, 381, 383, 435, 436
- Puysegur Ridge 87, 90
- Qanaya–Babatorun fault 282
- Quealy Dome restraining bend 105, 113
- Rachaya fault 289, 290, 294
- Red River fault 36, 38
- Red Sea 287
- Reelfoot Rift 118
- Reidel fractures 422
- Reidel shears 55, 57, 148, 164, 165, 423
- relay zones 7, 8, 169, 351, 417, 421–422
 horizontal strain 429
 normal faults 418
 poly-deformation 351–366
 reactivated 351
 soft linked 422
 width and overlap 429
see also transtensional relay ramp
- releasing bends 1–12, 2, 3, 36, 41, 170, 171, 191–193, 309
 causes 41, 42
 classification 13–142
 earthquakes 319
 evolution 40–41, 41
 fault geometry 447–471
 fluid flow 7–8
 gentle 54
 geometry 54, 346
 models 183–184
 morphology 13
 progressive evolution 182–183
 spreading ridges 63
 structural styles 120
 subsidence 126, 144
 tectonic origins 13–142
 terminology 34–36, 120
 vein architecture 447–471
see also relay zones; stepovers
- restraining bends 2–4, 52, 170, 219, 325, 345, 353, 358–362, 382
 analogue models 61, 143, 162, 165, 305–306, 345, 346
- basement controls 6–7
 block model 61
 bypassing 239
 classification 13–142
 deep structure 60
 development 123–124, 239
 earthquakes 60, 144
 end members 325
 evolution 51, 143–168, 182–183, 234, 320, 325–349, 358–362
- fault maps 231, 235
- gentle 36, 38–40, 44, 52–54, 58, 100
- geometry 44, 54, 144, 230–232, 447–471
- geophysical imaging 60
- intraplate areas 239
- kinematic model 61
- models 61, 123, 220, 344–346
- morphology 13, 51–54, 143–168
- mountain ranges 6, 219–220, 235
- numerical models 61
- paired bend model 123

- restraining bends (*Continued*)
 palaeomagnetic data 60, 61
 preservation potential 60
 regional significance of 239–243
 regional transtension 469
 S-shaped 52, 74
 sandbox models 220
 scale 1, 171, 232, 239
 sharp 36–38, 39–40, 52
 shear zone model 123
 sidewall ripout model 123
 structure 120, 143–168, 219–237
 structure and tectonics 58–60
 submarine 5
 switchyard behaviour 52
 tectonic models 55–58
 tectonic origins 1–12, 2, 13–142,
 219, 232, 243
 termination 143
 terminology 36–40, 120
 thermochronology 60–61
 thrusting 235, 325, 345
 topography 51, 219–237
 uplift 60–61, 126, 144, 148,
 149, 185
 vein architecture 447–471
 Z-shaped 52, 74
see also relay zones; stepovers
- reverse faults 148, 358–362, 367,
 382, 383, 417, 438
 oblique 190, 191, 192
- rheology 7, 203, 215, 351, 363
- rhomboidal basins 46, 68, 70–71,
 74, 96
 depocentres 46, 51
 extinction 47
 inversion 46
 length width ratio 47
- Ridge Basin, California 48, 71
- rifts, failed 116, 120
- Rio Lempa Basin 113, 121
- Rivera triple junction 171
- Rodgers Creek fault 37
- Rokko Range, uplift 112
- Roum fault 289, 290–291,
 295–296, 300
- Round Valley basin 67
- Round Valley fault zone 67
- Ruahine fault 399, 400–401, 408
- rupture zone 96, 97, 189, 193, 198, 199
 boundaries 50, 52
 complex pattern 198
 length 196, 198, 199
 probability and stepover width
 189
 propagation 2, 433
- Russia 45, 110
- sag ponds 54, 169
- Sagaing fault 308
- St George Basin 116, 124
- Salina del Fraille, S-pull apart 110,
 118
- Salinian basement 171
- Salquin fault 282
- Salton Trough 69, 71, 153, 240
- San Andreas fault 5–6, 52–55, 152,
 165, 170–171, 189, 190, 194,
 240, 240, 249, 250
 activity history 176
 basin inversion 169
 bends 65–68
 Cholame Valley 191–192
 earthquake hypocentres 60
 eastern bypass fault system 68
 migrating stepovers 170–171
 northern 171
 right lateral 65
 S-shaped bend 58
 seismic data 176
 slip rate 172, 176
 slip transfer 179–180
 tectonic setting 63–65, 64
 transpression 65
- San Bernardino Mountains 39,
 53–54, 59–60
- San Bernardino restraining bend
 59–60, 70–71, 249, 250, 251
- San Bernardino Valley 192–193,
 195, 197
- San Bruno fault 176
- San Clemente Basin 154, 156
- San Clemente fault 143, 145, 148,
 155, 162–163
 bathymetry 146, 147
 bend morphology 152–153, 152
 deformation depth 149
 fault scarp 153–154, 154
 folds 146
 geological structures 146
 PDZ 146, 147, 150, 153–154
 sedimentary sequences 155
 seismic profiles 149, 150, 151
 slip rate 153, 155
 strike 152–153
 uplift 143, 147, 153, 155
- San Diego Trough 143, 159, 163
- San Diego Trough fault 148, 155,
 160, 161
 PDZ 150
 pop up 162, 162
 restraining bends 161–162
 strike 161–162
- San Gabriel fault 70, 71, 251
- San Gabriel mountain 70–71
- San Gabriel submarine canyon 160
- San Gorgonio Pass 194, 197
- San Gorgonio restraining bend
 194–198
- San Gregorio fault 172, 176–178
- San Isidro fault 148
- San Jacinto fault 37, 192–193, 198,
 250, 251
- San Pablo Bay basin 37, 67
- San Pedro Basin fault 160
- Sandwich plate 203
- Santa Barbara Island,
 earthquake 157
- Santa Catalina Island 69, 143, 145,
 155–159, 157, 163, 165
 basement 157
 bend morphology 157–158
 deformation history 158–159
 elastic dislocation fault model
 158
 fault geometry 157–158
 seismic profiles 158
 tomographic models 158
 uplift 158, 159
- Santa Cruz Mountains 39, 58, 59
 fold and thrust belt 171
 releasing bend 65–67
- Santa Cruz restraining bend 53–54,
 58, 65, 67
- Santa Cruz–Catalina Ridge
 155–157
- Santa Marta Fault 92
- Schio–Vicenza Line 356–357
- Scotia Arc 203
 crust 214
 epicentres 204
 geological setting 204
 stress regime 213
 submerged banks 213, 213, 214
 tectonic models 213, 214
- Scotia plate
 models 84
 motion 85
 subduction 210
- Scotia Ridge 203
 North 84–85
 South 203, 205, 206, 206,
 213–214
 West 204
see also Western South Scotia
 Ridge
- Scotia Sea fault 84–87
 North 84–87, 85, 86–87
 South 86–87, 87
- Scotia–Antarctic plate boundary 6,
 205, 206, 213
 data 205–206
 earthquake epicentres 205
 extension 203–217
 free air gravity anomalies 205,
 205
 Moho densities 205
 regional stress regime 204
 seismic profiles 207
 tectonic structures 214
- Sea of Galilee 47
- Sea of Marmara 56, 96
- secondary faults 146, 154, 163,
 425–426, 425, 429, 430
- sediments 156
 fault controlled 124
 liquefaction 245
- seismic reflection 5, 49–50
- Septentrional fault 82–83, 84
- Serghaya fault 279, 280, 289,
 290, 295
- slip rate 281, 285, 294

- Shackleton fracture zone 204, 206
 shear failure 434–435, 434
 en échelon linkage 14
 fractures 100, 437
 planes 433, 439, 440, 443
 zones 5, 344, 459, 468, 470
 see also pure shear; simple shear
 short cut faults 7, 321
 sidewall ripouts 5, 13, 14, 53, 54–55, 64, 70
 Sierra de Minas 78, 80
 Sierran microplate 65, 67, 71
 Signal Hill 157
 Silver City fault 452, 453–455, 459, 461, 468
 Silver Creek fault 193
 Silver Dyke fault 466–467
 Silver Pit, North Sea 48
 simple shear 52, 344, 383, 435
 Sinai plate 286, 287, 294, 301
 Sing Buri Basin 312, 317
 Singkarak pull apart 109
 Siqueiros transform 62, 63
 slickensides 154, 173, 382, 439
 formation temperature 316–317, 316
 plunge 315, 315
 rake 422, 428
 slip ratio, horizontal to vertical 389–390, 391, 412, 425
 slip vector 8, 405, 406, 411
 boundary coherent 387
 geometric constraints 429
 heterogeneous extension 407–410
 pitch 401, 403, 407–410, 408, 412
 subparallel 389, 412, 417
 South America plate motion 85
 South Carolina 118
 South China Sea 36, 38
 South Coast fault 247, 248, 250, 252
 South Georgia Island 85–87
 South Georgia rift basin 120
 South Orkney microcontinent 204, 206, 208–210, 213, 215
 South Shetland Block 204
 Southern California
 convergent region 68–71
 faults 145
 paired bends 159
 piston cores 156
 plate motion vectors 145
 restraining bend 165, 249–251
 San Andreas fault 69, 71
 sediment uplift history 156
 seismicity 145
 Southern Phitsanulok Basin 317–318
 Spain 38
 spreading ridges 46, 63
 Spur Tree fault 242–243
 Stellarton pull apart basin 37, 48
 stepovers 1, 8, 45, 52, 67, 248, 320, 433
 at depth 193–194
 bounding faults 459, 468–469
 contractional 462–468
 earthquakes 189
 end members 169, 184
 evolution 169–188, 468
 fault geometry 459–462, 461
 normal faults 459
 nucleation 6, 468, 470
 width 3, 6, 65–67, 219, 235
 see also dilational stepovers; migrating stepovers
 stereoplots 425, 427–428, 438, 441
 strain 3, 367, 383, 435
 fields 144, 433, 434, 437, 437, 449
 finite 381, 436, 437, 443, 443
 hardening 3, 220, 235
 prolate 436
 see also elastic strain
 strain partitioning 3, 7, 58, 59, 74, 148, 152, 219, 247, 285–303, 367, 383, 436, 438, 462, 464
 stress 3–4, 345–346, 425–426, 429, 434, 459
 determination 426
 inversion 441
 principal axes 220, 354–355, 425, 430, 434, 448, 449
 strike slip faults 1, 13–142, 387, 468
 arc parallel 1
 at depth 49, 189–201
 basin types 36
 bends 1–12, 14–17
 cross basin 51
 displacement 219, 233
 examples 17
 geometry 434
 migration 469
 oblique 51
 progressive evolution 55
 propagating 243
 shear zones 344
 surface complexity 189–201
 tectonic setting 16, 40
 termination model 387–415
 terminology 16–40, 434
 types 13, 16, 17, 40
 subduction zone 13, 90, 170, 204, 206
 orientation 107, 109
 volcanism 449
 subduction-transform edge
 propagators (STEP faults) 77
 subsidence 47, 124, 306–309, 338
 suction pump behaviour 442, 442
 Sukhothai zone 307, 308, 328
 Sumatran fault 35–36, 107, 115
 paired bends 107–109, 116
 Sumatran trench 107
 Sunda Strait 35–36, 107
 Suphan Buri Basin 317
 Sutai Uul 226–227, 229–230
 SW Fracture Zone 192, 193, 194
 Swan Islands fault 241
 Syrian Coastal Range 277
 Tak–Nakhon Sawan fault 318–320, 321
 Taupo Rift 8, 387, 389, 390, 391, 404, 408, 409, 412
 extension rate 410, 411, 411, 412
 faults 399, 408–410
 tectonic escape 59–60, 90–105, 306, 309, 321, 344
 tensile failure 434–435
 fractures 50, 433, 434
 tension gashes 379, 382
 Terror Rise 210–211, 213
 Thailand 305–323, 325–349
 cooling age patterns 331, 333–338, 334, 335
 earthquakes 319
 thermochronology 468
 Three Pagodas fault 306–307, 308, 319, 331, 346
 cooling history 331
 deformation timing 331
 trace 309, 310
 thrust faults 1, 7, 362, 363, 367, 371, 382
 blind 7, 373
 displacement 233, 234
 duplex model 320
 leading ramp 53
 offshore 90
 sheets 352–353
 strike slip accommodation 233
 trailing ramp 53
 Thunder Mountain Block 466–468
 Tibet 58, 106
 Tibetan Plateau 100–103, 106, 107
 Tien Shan
 bend geometry 224–225, 225, 228
 fault systems 221
 geology and active tectonics 220–225, 232
 restraining bends 219–237, 223
 topography 221
 Tierra del Fuego 85, 85
 Tomales Bay depocentre 172
 Tonhil fault 229
 Tormeno fault 351, 356, 358, 362, 363
 Transdanubian Range 418, 419
 transform faults 1, 34, 356
 intracontinental 367–385
 plate boundary 4, 40, 164, 165
 reactivation 143
 transpression 1, 4, 34, 51–52, 68, 143, 382–383, 384
 transtension 1, 4, 34, 44, 67, 143, 239, 418, 436
 3D strain 435–436, 441
 basins 233–235
 deformation theory 435–438
 extension dominated 435–436, 436, 438, 442, 443

- transtensional relay ramp
 3D model 428
 displacement transfer 426–428,
 427–428
 end member 428
 fault geometry 426–429
 geometric models 427–428
 tilting 426–428
- Transverse Ranges 61, 70, 240
 block rotations 61
 inferred detachment 60
 paired bend 69
 restraining bend 59–60, 68–69,
 70–71, 239–240
- trench linked faults 5, 13, 15, 40, 54,
 105–107
- Trento Platform 351, 352, 356, 362
- Trinidad 84
- triple junction 180, 180, 203
- Tripoli 296–299, 298
 cross section 297
 elevated terraces 297, 298, **299**
 geology 296
 isostatic compensation 299
 notched coastlines 296–299, 298
 uplift 296–299, 296
- Tsambagarav Range 226–227
- Tsambagarav Uul 229
- Tunka Basin 105, 111
- Turbol anticline 296, 301
- Turkey 35–36, 92–96, 255–284
 earthquake 194
 regional uplift 278
- U-Pb dating 333
- Umphang Gneiss 325, 333, 342–343,
 343, 346
 exhumation 336, 340
 thrust uplift 345
- unconformity 248, 306
- uniform extension model 47
- uplift 2, 52, 124, 235, 316, 329
 asymmetrical 143, 153, 163
 linear transpressional 68
 mechanisms 60–61, 329
 predicted 179–180
 rhomboidal 52
 spatial temporal evolution 7, 235
 steady state 4, 235
- Variscan Orogen 438
- veins 8, 428, 439–440, 441,
 449–450, 453–454, 470
- ages 451
 banded 462
 density 467
 and fault systems 469–470
 geometry 449
 mineralization 469–470
 permeability structure 449
 textures 442, 442, 454
- Venezuela 84, 92, 94
- Vértes Hills 418, 419
- vertical axis rotations 3, 220, 234,
 235, 389, 405–407, 406,
 410–411, 410, 412
- Vienna Basin 96, 99
- Villa Vasquez bend 84
- Villa Vazquez fault 39
- Virginia City 447, 448, 456, 460, 461,
 462, 470
 displacement 450–459
 fault relations 453
 fault types 450–459
 geology 450, 451
 Jumbo 450–452, 468
 magnetic susceptibility 455,
 458–459
 mineral exploration 469
 sedimentary rocks 450–451
 striation data 450, 454
 volcanism 450–455, 456, 468
- Wagwater Rift 80, 242–243, 245,
 248, 251, 251
- Waimana fault 391, 399, 400,
 402–403, 408
- Waioka fault 391, 399
- Waiohau fault 391, 399, 400, 408
- Waiohau–Ruahine fault 400–401
- Waiotahi fault 391, 399, 403–404,
 408
- wake 169, 170, 172, 179, 184, 186,
 468, 469
 bi-directional 183
 geochronological data 185
 inversion 183
 length 6, 172, 177–178, 180
 length and slip ratio 169, 184,
 185, 186
 transpression 169
 uplift 178, 183, 185
- Walker Lane 462, 469
 basin 71
 shear zone 71–72, 72
- Walton fault 241, 245
- Walton-Plantain Garden/Enriquillo
 faults 244–245
- Wang Chao fault *see* Mae Ping fault
- Weddell Sea 204, 207–208, 210
- Wellington-Mohaka-Whakatane
 fault 403
- West Jamaica releasing bend 241,
 245, 248
- Western South Scotia Ridge 203,
 210–213, 215
 3D block model 212
 active deformation 211
 asymmetrical basins 215
 fault geometry 211–213
 focal mechanisms 211–213
 free air gravity anomalies 215
 internal basins 212
 magnetic anomalies 210–211
 seismic profiles 204, 211
- Western Zone 328
- Whakatane fault 391, 399, 400, 401,
 402, 408
- Whakatane-Mohaka fault 401–402
 kinematic transition 405
 slip vectors 401, 402
- Whin Sill 438–439, 440, 443
- wrench dominated domains
 438–439, 439
- wrench dominated transpression 381
- wrench dominated transtension 433,
 435–436, 436, 437, 437, 438,
 439, 441, 443
- wrench faulting 285
 model 148, 162
 structures 442
- wrench simple shear 435, 436
- wrench tectonics 299–300
- Yallahs fault zone 80
- Yammouneh fault 74, 280, 289,
 291–294, 295
 constraints on 291–294
 slip rate 281, 285, 290, 291, 294
- Yassi Tepe basalt 262–263, 263,
 271, 276
- Yünlü Tepe 262–263, 264–265
- Zagros fold-and-thrust belt 97
- Zalqa fan 291–294, 292
 Cl dating 293–294, **293**
- Zebadani Valley 290
- zircon fission track 325, 329–331,
 332, 334