

# Index

Page numbers in *italic* e.g. 247 signify references to figures. Page numbers in **bold** e.g. 32 denote references to tables.

- Adriatic basin 245–269, 247, 248  
  boundary surfaces 255, 256, 258, 261, 261, 262  
    stratigraphic position 263  
  chronostratigraphy 261  
  deposits  
    preservation 262–263  
  forced regressive deposits  
    preservation 264–265  
  forced regressive systems tract 251  
  Gallignani Ridge 249  
  highstand systems tract 251, 254  
  incised valleys 258, 261, 263  
  lowstand systems tract 251  
  Mesoadriatic Deep (MAD) 248, 251, 264, 265  
  Quaternary  
    cycles 260  
    sea-level changes 260  
  regressive units 253–258, 261  
  ridge-and-swale morphology 256, 263  
  seismic studies 249, 250, 252  
  shelf-perched wedge 248, 249, 250, 253, 258, 266  
    age 258–261  
    stratigraphy 253–261  
  tectonic deformation 249  
  transgressive systems tract 252, 254  
  Tremiti High 249, 252–253, 253
- Alaska  
  Kuparuk Formation 32, 36
- Alberta  
  Dunvegan Formation 11–13, 13  
  Grande Cache 13  
  Marshybank Formation *fold-out between pages*  
    8–9, 10
- alluvial aggradation 6
- Alta Delta, Norway  
  forced regression 22, 24
- Apennines 219–220, 248, 251
- beach terraces 26, 26
- Betic Mountains 331
- Bighorn Basin, Wyoming 113–139, 114  
  architecture 113–139  
  Campanian 113–139  
  Claggett Formation 129, 130  
  forced regression 113–139  
  Mesaverde Group 114, 132  
    sequence boundary surface placement 133–135,  
      136–137  
    cyclical deposition 116–118  
    facies associations 115–118, 116, 117  
    regressive surfaces of marine erosion 118–129,  
      121, 132–134  
    subdivisions 115  
  stratigraphy 118  
  Syncline Draw 130  
  Virgelle Member 120, 122, 125, 128
- see also* Hanna Basin, Wyoming
- bioclastic facies 227
- bioturbation 83  
  Calcarenite di Gravina Formation 223–224, 225,  
    229, 233, 234  
  Mesaverde Group 145, 147, 148, 149, 151, 153, 155  
  Nukhul Formation 180, 182  
  Peloponnese 368  
  Sobrarbe Formation 186, 187–189  
  *Thalassinoides* burrows 182, 183, 368  
  and zone of maximum flooding 157
- boundary surfaces 6, 14, 20, 58, 102–103  
  Adriatic basin 255, 256, 258, 261, 261, 262  
  Calcarenite di Gravina Formation 223–224,  
    224–225, 224, 227, 228, 229, 237–238  
  and erosion 127, 263–264  
  Gassum Formation 81, 82, 85  
  high order 39, 122–123  
  lower 20–21, 38  
  and megabreccias 63–64  
  Mesaverde Group 133–134, 136–137  
  Petane Group 195, 202, 202, 203, 204, 204, 211  
  placement 2, 5, 39–43, 40, 42, 57, 87, 88, 163, 263  
  and detached sandbodies 172–174, 173  
    Gulf of Cádiz Quaternary formations 353–355  
  position 37  
  stepped v. smooth-topped 29  
  upper 21, 37–38
- bounding surfaces *see* boundary surfaces
- Brent Group *see* North Sea, Brent Group
- Brent Province 92
- British Columbia  
  Marshybank Formation 10
- Brønlund Fjord Group 48–50, 50
- c cycles 343, 346
- Cádiz shelf/margin *see* Gulf of Cádiz
- Canada, Western Interior  
  Bearpaw–Horseshoe Canyon transition zone 164,  
    164  
  Horseshoe Canyon Formation 164–165  
  tectonic uplift 169–170
- Canterbury Bight, New Zealand 29–30
- carbonate systems  
  characteristics 218–219  
  megabreccias 47–68, 58–59
- Cenozoic  
  tectonic activity 246, 249
- Cope Basin, Spain  
  forced regressive deposits 22
- cross-bedding 148–151, 148, 149, 150, 151, 156,  
  201
- cyclical deposition 5–6, 9, 80, 87  
  Bighorn Basin 116–118, 121–122  
  Calcarenite di Gravina Formation 224–225  
  Quaternary 246, 265, 266, 280

- Danish Basin 69–89, 70, 71  
 Fjerritslev Formation 82  
 Gassum Formation 69–89, 71, 72  
   stratigraphical sequences 71  
 Rhaetian 70–89, 74–75, 87  
 sandstones  
   correlation 73  
   lateral distribution 72–77  
   sedimentology 77–80  
 Stenlille area 75, 75, 80, 82, 83, 85, 86  
 Dansgaard–Oeschger cycles 343, 346  
 datum, choice of 9–10, 144  
 deltaic deposits 232–234  
   *see also* Alta Delta; Lagniappe Delta; Niger Delta;  
   Rhône Delta  
 depositional sequences classified 1  
 Dryas stage 352
- eccentricity cycles 341  
 equilibrium profiles *fold-out between pages* 8–9  
 erosional regression 127  
 Etive Formation *see* North Sea, Etive Formation  
 Exxon model 47, 48, 177, 287, 352, 353, 357
- falling sea-level systems tract *see* falling stage systems tract
- falling stage systems tract (FSST) 2, 82  
 boundaries 5  
 definition 3–5, 14  
 formation 5–8  
 importance 1–17  
 recognition 1–17  
 schematic evolution 8, 134  
 flooding surfaces 118, 157, 180, 182, 189, 333  
 Peloponnese 369, 369  
   *see also* maximum flooding surfaces  
 fluvial activity 94–96, 129–132, 131, 134–135, 341  
 foraminiferal analysis 206, 258, 261, 280  
 forced regression 2  
 architecture 44, 113–139  
 characteristics 20  
 definition 163  
 genesis 113–139, 245  
 importance 245  
 normal regression compared 19, 20, 91–112,  
 193–215, 206–207  
 recognition 32, 33, 113–139, 237, 262–263  
 and sedimentation 80, 169, 238  
 stepwise 69–89, 81  
 stratigraphic modelling 163–176  
 and thrust faults 184–191
- forced regressive deposits 158, 206–207, 238  
 and aggradational–retrogradational sets 264  
 attached 262  
 attached v. detached 21–29, 163–176  
   factors influencing formation 26–29  
   oil and gas exploration 29  
 carbonate systems 234  
 classification 47–48  
 detached 26, 188, 190  
 determining criteria 43–44, 331–332  
 erosional surfaces 253  
 field examples 7  
 highstand deposits compared 38  
 historical overview 47–48  
 idealized sequence 178  
 preservation 21, 264–265, 265  
 and prograding units 257  
 recognition criteria 31–37, 238  
 sandbodies 183, 190  
 stepped v. smooth-topped 29–31  
 under stepwise progradation 85  
 stratal architecture 19–45, 21, 193–194  
   and steepness of slope 30  
 strike variation 363–377  
 and tectonics 117–193, 184, 209  
 terminology 38–39  
 and transgressive deposits 238  
 types 21–31  
 zone of sedimentary bypass 31, 261
- forced regressive shorelines 43  
*see also* shorelines
- forced regressive systems tract (FRST) 47, 206–207,  
 206, 208–209  
 Adriatic basin 251  
 positioning 208–209  
 volumetric importance 265  
*see also* falling stage systems tract
- forced regressive wedge systems tract (FRWST) *see*  
 forced regressive systems tract
- fossil fauna 77–79, 83, 122–125, 194–195  
 bioclastic facies 227  
 and bioturbation 145, 147, 149  
 and borings 204–205, 205, 227  
 Calcarene di Gravina Formation 222–223, 222,  
 223, 229, 232–233  
 Nukhul Formation 180–181  
 Petane Group 198, 199, 199, 200, 201  
 shellbeds 204–205  
 Sobrarbe Formation 186–189  
*see also* trace fossils
- fossil flora 77–80, 196  
*see also* plant roots; root casts
- Franklinian Basin 48, 48–49
- geomorphology 331  
 Great Salt Lake 22  
 Greenland  
 Cambrian 47–68  
   Aftenstjernesø Formation 56, 58–59  
   Ekspedition Bræ Formation 50–51, 54  
 Cambrian shelf  
 lithostratigraphy 48–50  
 Cambrian strata  
 carbonate half-cycles 54, 56–57  
 carbonate–siliciclastic half-cycles 52–56  
 cyclicity 50–57  
 Lønelv Formation 50, 60–61  
 Franklinian Basin 48–49, 48–49  
 Henson Gletscher Formation 50–51, 52–56, 53, 54,  
 58–59  
 J. P. Koch Fjord 58–59  
 Nordenskiöld Fjord 52, 54, 54–55, 57, 63  
 Nyeboe Land 54, 56  
 Peary Land 50, 58–59, 60  
 Sydpasset Formation 53, 53, 57  
 Gulf of Cádiz 329–361, 330  
 boundary surfaces 332–333, 353–355

- depositional sequences 339–341, 356, 357  
 erosion surfaces 336, 337, 353–355, 357  
 forced regressive systems 331  
 forced regressive systems tract 333, 336–337, 339, 340, 341, 345–346  
   attached and detached 353  
   reasons for dominance 357  
   sedimentary responses 346–352, 348, 349, 350  
 geomorphology 331  
 highstand systems tract 333, 336, 337, 339, 340, 341, 345–353  
   volumetric significance 352–353  
 incised valleys 333, 351  
 lowstand systems tract 337, 339, 340, 341, 345–346, 351–352  
 Quaternary stratigraphy interpretation 345–357, 356  
 seismic methods 331  
 seismic units **332**, 333–339, 334, 335, 339, 345, 356  
 sequence boundaries 332–333, 353–355  
 step structure 339, 344  
 stratigraphic model 346–347  
 transgressive systems tract 333, 337, 338–339, 339, 340, 341, 345–353  
 Tyrrhenian II deposits 336, 351  
 Tyrrhenian IV 336–337, 341, 351  
 Gulf of Corinth 40–41, 41, 364–365, 371–372, 374  
 Gulf of Mexico 36, 260, 263  
 gutter casts 6, 7, 10, 14, 77, 84, 125  
   in Hatfield sandstone 147
- h cycles 343, 346
- Hanna Basin, Wyoming  
   Campanian 141–162  
   forced regressive wedges 141–162  
   Hatfield Member 141–162, 148  
     cross-bedding 148–151, 148, 149, 150, 151, 156  
     facies associations 144–153, 146  
     palaeogeography 143–144, 144  
     stratigraphy 143–144, 153  
   Haystack Mountains Formation 141–162  
     stratigraphy 143  
   lowstand/transgressive wedges 141–162  
   Mesaverde Group 141–162, 142  
     facies interpretation 142  
   see also Bighorn Basin, Wyoming
- Heinrich events 342–343, 346, 357
- higher-order sequences 6–8
- highstand systems tract (HST) 57, 157–158, 183, 205–206, 206  
   Adriatic basin 251  
   definition 3, 14  
   and mass-flow breccias 61
- Hikurangi Trough 195
- Holocene see Quaternary
- Iberian coastline 331, 336, 341, 343, 344, 346, 353, 354  
   see also Gulf of Cádiz
- ichnofossils see trace fossils
- Kradis river 370, 371
- Lagniappe Delta 24
- Latium margin, Tyrrhenian Sea 271–289, 272, 277, 278, 281–283
- acoustic facies 280  
 depositional gullies 279  
 depositional terraces 276–278, 279, 286  
 erosional unconformities 278–279, 283, 287  
 forced regressive deposits 271–272, 284–286, 287  
 forced regressive wedge systems tract 287  
 highstand systems tract 276, 278, 284–286, 287  
 incised valleys 279–280  
 lithostratigraphy 282  
 lowstand deposits 284–286  
 morphology 274  
 oxygen isotope record 280  
 sea-level changes 286  
 sediment preservation 275  
 sediment supply 274, 274–275, 286  
 sediment volume 283–286, 285  
 seismic profile 272, 273, 284  
 seismic stratigraphy 275–286  
   and gravity cores 283  
 sequence boundaries 281–286  
 single-channel profile 274  
 stratigraphical correlation 283, 285, 286–287  
 subsurface features 275  
 tectonic activity 272, 273–274  
 transgressive systems tract 276, 278, 284–286, 287  
 Würm unconformity 275–276
- Louisiana Coast 42, 42
- lowstand prograding wedge (LPW) 56
- lowstand systems tract (LST) 3, 56, 155, 206, 208–209  
   Adriatic basin 251  
   attached v. detached 163–169, 164  
   definition 14  
   generation 170–172, 172  
   in Petane Group 203–204
- macrofossils see fossil fauna, fossil flora
- marine terraces 26, 26
- Marshybank Formation 10
- maximum flooding surfaces 118, 157, 205, 206, 336, 355
- megabreccias 62  
   characteristics 58–60  
   and definition of systems tracts 63  
   depositional processes 58–60  
   differentiation 64–65  
   regional extent 62–63, 62  
   and sea-level fall 63–64  
   sequence stratigraphy  
     highstand capping 61–63  
     intra-highstand 61  
     lowstand 60–61  
   significance 48
- Metis River, New Brunswick 25
- microfossils 84, 206, 258, 261
- Milankovitch cycles 341, 357
- Millsite Reservoir, Utah 43
- New Mexico  
   Fruitland Formation 31–32, 34–35  
   Lewis Shale 31, 32, 35
- New Zealand  
   Darkys Spur Formation 196, 198, 199, 199, 202, 203  
   sedimentation rates 207

- New Zealand *continued*  
 upper contact surface 204  
 Esk Formation 201  
 Kaiwaka Formation 196, 202, 203, 206–207  
 Petane Group 193–217, 195, 197, 201, 210  
 carbonate deposits 196, 201, 202, 203–205, 208–209, 210–211  
 continuity of deposition 207–208, 208  
 cyclothem 194–195, 200  
 facies assemblages 196–200  
 sediment bypassing 209  
 sedimentology 196–200, 207, 208–209  
 subsidence rates 207–208, 211–212  
 systems tracts 195, 200–211, 202, 211  
 and tectonics 209  
 Ruahine Range 198  
 Tangoio block 193–217, 194  
 Tangoio Formation 211  
 Taupo Volcanic Zone 198, 200  
 Tutira Formation 199, 202, 203  
 Waipatiki Formation 199, 200, 203, 211
- Niger Delta 125
- North Platte River, Wyoming 149, 151, 152
- North Sea  
 Brent Group 91–112  
 development 93–94  
 evidence for forced regression 100  
 sequence stratigraphy 93–94, 97–99  
 ‘Brent Province’ defined 92  
 Cormorant Field 96, 97  
 Etive Formation 91–113  
 boundary surfaces 99–101  
 depositional environment 94–97  
 fluvial-dominated environment 94–96, 134–135  
 tide-influenced environment 96  
 wave-dominated environments 96  
 stratigraphic interpretations 92, 94–95, 97  
 Lomre Terrace 101, 103  
 Murchison Field 96, 97  
 Ness Formation 97, 98, 99, 100  
 Rannoch Formation 94  
 Rannoch-Etive boundary 97–103, 99, 100  
 Staffjord Field 100  
 Tampen Spur 96  
 Thistle Field 100
- offlap  
 defined 4
- oxygen isotope record 280, 342–343
- P cycles 343, 346  
 palaeochannels 339, 341, 351  
 palaeocurrents 125–126, 128, 149, 151, 199  
 Panther Tongue Sandstone, Utah 27, 28, 36  
 parasequences 156, 157, 355, 357  
 normal sequences compared 8–9  
 ‘stranded’ 69–70, 85–86, 88
- Peloponnese 24, 40–41, 41, 363–377  
 attached shoreface deposits 365–367  
 bioturbation 368  
 boundary surfaces 266, 368, 371  
 Corinth canal 365–369, 366, 366, 375  
 detached shoreface deposits 367–369, 372  
 drainage pattern 373–374, 373  
 fan-delta deposits 369–371, 370, 373, 374  
 forced regressive deposits 365, 370–371  
 physiography 374  
 sea-level changes 365, 371, 372  
 sediment supply 373–374  
 slope gradient 274  
 Smarpsi fan 365, 374  
 stacking pattern 366–367, 366, 367, 368, 370–371, 372  
 strike variability 363–377, 375  
 study area 364  
 tectonic activity 371, 372  
 terraces 367, 367, 369  
 Trikalitikos valley 367  
 U-series dating 365, 369, 372  
 Xylokaastro fault 364
- Perachora Peninsula 374
- placement  
 boundary surfaces 172–173, 173  
*see also* sequence boundary and maximum flooding surfaces
- plant roots 101, 101, 130  
 Gassum Formation 75, 77, 79, 80  
 Petane Group 196, 198
- Pleistocene *see* Quaternary
- Po river and plain 248, 251
- pollen spectra 260
- Pontine Islands 276, 279
- progradation 81, 86, 124
- Puglia, Italy 217–243, 218, 219, 220, 221, 226  
 Apennines 219–220  
 Apulian platform 219  
 Calcarenite di Gravina Formation 222–227, 222, 223, 225, 227, 231–232  
 composition 222–223  
 cyclicity 224–225, 236  
 exposures 226–227  
 facies 224–226, 232–234  
 carbonate–clastic systems 217–243  
 Minervino area 230–239, 230, 231–234, 231–232, 237  
 Murge area 217–239, 235–236, 236  
 tectonics 220–222, 249
- Pyrenees 177–178, 184–191, 188  
 Ainsa basin 184–191  
 Las Gorgas sequence 185–191, 190  
 Sobrarbe Formation 178, 184–191, 185, 186  
 sequence stratigraphy 189
- Quaternary  
 climatic change 341–344  
 cyclicity 329, 341–344, 342–343, 344, 346–352, 355–356  
 environmental changes 355–356  
 forced regression 245–269  
 geophysical conditions 245–246  
 sea-level fall 329–361  
 sea-level fluctuations 245–246, 260, 271–289, 280, 341–344, 351  
 sequence stratigraphy 329–361
- ramp setting sequence *fold-out between pages* 8–9
- ravinement surface 81, 86, 129–132, 203, 204, 210  
 Adriatic basin 251

- Calcarenite di Gravina Formation 223–224, 234
- reciprocal sedimentation 57
- regression
  - defined 19
  - and transgression compared 19
- regressive surface of marine erosion (RSME) 6, 118–129, 127
  - Bighorn Basin 132–134
  - and soft sediment deformation 125, 126–127
- regressive surfaces of erosion 5
- retrogradation 209–210
- Rhône Delta and Shelf 23, 31, 32, 256, 262
- root casts 101, 101, 130
  - Gassum Formation 75, 77, 79, 80
- Ryder Gletscher group 48–50, 50
  
- sea-level curve *fold-out between pages 8–9*
- sea-level fall
  - and boundary definition 262
  - in Calcarenite di Gravina Formation 224–225
  - in Danish Basin 77
  - Quaternary 329–361
  - and shelf deposition 2
- sediment preservation 43
- sedimentary bypass 31, 32
- sequence boundary *see* boundary surfaces
- sequence stratigraphic analysis 1–17
- shellbeds 204–205, 205
- shoreface deposits 2, 22, 69–89, 144–148, 203
  - erosion 129, 264
  - of forced regressive systems tracts 158
  - sharp-based 127, 173, 189
- shorelines 43, 199, 234
  - architecture 102–103
  - migration 20, 25
  - progradation 81
- Smarpsi fan 374
- Sobrarbe Formation, Pyrenees 189
- soft sediment deformation
  - Bighorn Basin 125, 126–127
- Sowbelly Gulch, Utah 27
- Spanish continental shelf *see* Gulf of Cádiz; Iberian coastline
- stacking pattern 4, 5, 57, 58, 121–122, 191
- Star Point Formation
  - Panther Tongue Member 27, 28
- 'stranded' parasequences 69–70, 85–86, 88, 355
- stratigraphic modelling 1–2, 135–136, 163–176
  - and anomalies 166–167
  - applications 165–166
  - input variables 166
    - and sea-level 167, 167, 168, 169
    - and sediment supply 167–169, 169
    - and tectonic uplift 169–170
- stratigraphic sections
  - foreshortened 36
- Suez rift 177–183, 179
  - Baba-Sidri fault 178, 179, 180, 183
  - El Qaa fault block 178–179, 179, 180, 183
  - Nukhul Formation 177–183
    - facies associations 179–183
    - sequence stratigraphy 179–183, 181, 182
- Sweden, southern 87
- Sydpasset Formation 53, 53, 56
- systems tracts
  - classified 1
  - definitions 3
  - historical perspective 1–3
  - and megabreccias 63–64
  - sequence stratigraphical model 1–2, 135–136
  - stacking pattern 4
  
- Tangoio block 193–217, 194
- Tavsens Iskappe group 48–50, 50
- Texas Gulf Coast 42, 42
- Tiber river 274, 276, 278, 279, 284, 286
- tidal activity 96, 150, 156–157
- trace fossils 52, 77, 83, 84, 150
  - analysis 281, 283
  - Calcarenite di Gravina Formation 229
  - Hatfield Member 147, 148, 151, 153
  - Mesaverde Group 122–125, 147, 148
  - Petane Group 198, 199, 199, 204
  - Sobrarbe Formation 187–189
- transgression 157, 234–236
- transgressive systems tract (TST) 14, 56, 134, 155, 183, 208–209
  - Adriatic basin 251
  - Petane Group 202, 204–205
- trilobites 52, 56, 57
- Tyrrhenian II deposits 336, 339
- Tyrrhenian Sea
  - tectonic activity 272
  - see also* Latium margin, Tyrrhenian Sea
  
- U-series dating 365, 372
  
- Viking Graben 91, 92
  - see also* North Sea
  
- Wasatch Plateau, Utah 28
- Würm interval 275–276, 346