

Index

Note: Page numbers in **bold** type refer to tables.

Alaska

- high-resolution chronologies 195–213
- Icy Bay, Guyot Glacier 195, 200–201, 211
- modern–Miocene records 215–244
 - Bering Trough 221
 - continental shelf/slope data 223–225
 - facies successions/motifs 225–229
- non-glaciated margin 21–22

Antarctica

- Cape Roberts cores **226–228**
- Transantarctic Mountains, generalized (Oligocene) 123
- West Antarctic Ice Sheet (WAIS) 277–304
 - see also* Ross Sea

Arctic continental margins, sediment reworking 325–348

Arctic continental slopes

- Polar North Atlantic 33–54
- sediment delivery and slope form 11–32
 - bathymetry 12–22
 - model of fan development 25–26
 - morphology comparisons 22–25
- see also* Alaska; Bear Island; Greenland; Iceland; Norway

Arctic Ocean and Polar North Atlantic, ice-sheet and sea-ice processes 33–54

Barents Sea

- 3-D seismic data, buried glacial horizons 259–277
 - stratigraphy 265–272
- bathymetry 260, 273

Barra Fan

- colour millennial-scale variability 349–366
- location map 350

basins

- Blosseville Basin, sediment reworking 334, 342–343, 345
- Greenland Basin, submarine channel systems 41–45
- Pacific margin of Canada 181–194

bathymetry

- Arctic continental slopes 12–22
- Barents Sea 260, 273
- past ice-stream flow morphology, Norway 249–253

beam attenuation coefficient (BAC) 202

- Bear Island Fan 19–20, 38–39, 55–71, 256
 - flow location and fan morphology 57–62
 - geological setting 57
 - gravity cores 90
 - non-GDF sedimentation 63–65
 - sediment release 76
 - sediment reworking 337–339

Beaufort Sea, high sediment-supply margin 21

Bellsund Fan 38–39

beryllium dating 197

- Bingham rheology 79–80, 98
- bioturbation, core records 338–339
- Blackman–Tukey spectral analysis 207, 208, 356–358
- Blosseville Basin, sediment reworking 334, 342–343, 345
- British Isles
 - deep-marine sedimentation, Late Pleistocene 129–148
 - ice sheet dynamics, variability in sediment colour 349–366

calcium carbonate, radiocarbon measurements **353**

- Canadian Archipelago, M'Clure Strait, ice shelves 20–21
- Canadian Beaufort Sea 21
- Canadian Pacific margin, Georgia Basin, sea-level changes 181–194

carbon dating *see* radiocarbon chronologies

- high-resolution chronologies, SE Alaska 195–215
 - see also* radiocarbon
- colour (sedimentation), variability, Barra Fan 349–366

constant initial concentration (CIC) method 199

constant rate of supply (CRS) method 199–208

continental shelf/slopes

- defining 14–17
- glaciated /non-glaciated, polar v. temperate **240**
- submarine mass-wasting 73–88
 - see also specific locations*

Crary Bank and Fan, Ross Ice Shelf 49, 278

current-winnowed sediments, v. iceberg rafted debris 344–345

debris flows, hydroplaning/non-hydroplaning 80–83

- debris flows *see* submarine debris flows
- erosion behaviour 95
- shear mixing rates and processes 89–105

fans *see* trough–mouth fans

fast-flowing ice-streams *see* ice-stream flow

Fennoscandinavian Ice Sheet 245–258

fjords, lithofacies associations **216**, 217–223

floc erosion rate 95

Froude number, debris flows, hydroplaning 93

Georgia Basin, Canadian Pacific margin, sea-level changes 181–194

giant piston cores 350

glacial advance surface 215, 238–239

glacial erosion surface 215, 238–240

glacial systems tracts 215, 217, 220, 232–240

glacial–interglacial cycles, ice-sheet behaviour 34–38

glaciations

- advance, retreat and re-advance sequence 218–219
- end-member processes 217

- Fraser Glaciation 188–193
 Last Glacial Maximum (LGM) 17, 149, 171–175
 Late Weichselian 37, 171–175, 245–258, 338
 glacier-surge periodicity, E Greenland, Mo records
 from marine sediment cores 367–373
 glacial debris flows (GDFs)
 linking with ice-sheet dynamics 68–69
 linking with suspension deposits 67–68
 see also submarine debris flows
 glacimarine succession
 Alaska 195–213
 facies model 120
 grain-size characteristics and provenance 305–325
 GLORIA side-scan sonar, Norwegian–Greenland
 Sea 327–329
 Greenland, *see also* Norwegian–Greenland Sea
 Greenland Basin
 sediment reworking 329–333
 submarine channel systems 41–45
 Greenland continental margin, East
 Kejser Franz Joseph Fjord 149–180
 chronology, radiocarbon ages 154–160
 continental shelf 164–168
 continental slope 167–171
 fjord area 160–164
 geological setting/ data acquisition 150–154
 summary/discussion 171–175
 Kong Oscars Fjord, Mesters Vig, surge periodicity,
 Mo records 367–373
 Nansen Fjord, grain-size characteristics,
 glacimarine sediments 309–310, 316–319
 sediment reworking 325–348
 Greenland Ice Sheet, Last Glacial Maximum (LGM)
 149
 grounding-line retreat surface 215
 Guyot Glacier, Alaska 195, 200–201, 211
- Hampton number 99
 Heinrich events 361
 hemipelagic sediments, Blossville Basin 334,
 342–343
 Herschel–Bulkley rheology 79
 high-latitude continental margins
 ice-sheet and sea-ice processes, Polar North
 Atlantic 33–54
 idealized 34
 sediment reworking 325–348
 Holocene, sedimentation rates 338
 hydroplaning
 Froude number 93
 submarine debris flows 80–81, 91–92, 100
- ice shelves, defined 20–21
 ice-proximal glacimarine sediments
 Canadian Pacific margin 181–194
 grain-size characteristics and provenance 305–325
 ice-sheet dynamics 245–259, 277–305
 glacial–interglacial cycles 34–38
 glacial debris flows (GDFs) 68–69
 Polar North Atlantic 33–54
 Norwegian–Greenland Sea 36–38
 ice-stream flow
 characteristics 17–19
 large-scale morphology 245–259
 retreat signature, Antarctica 277–304
 iceberg scours/plough marks 35, 268–269, 274,
 289–291
 iceberg plough marks/furrows
 E Greenland 35
 ice-sheet dynamics, Barents Sea 268–269, 274
 Norwegian–Greenland Sea 339–340
 Ross Sea 289–291
 iceberg rafted debris 239
 v. current-winnowed sediments 344–345
 grain-size characteristics, glacimarine sediments
 305–325
 sediment volumes 319
 significance and genesis 343–344
 Iceland margins, grain-size characteristics,
 glacimarine sediments 306–308
 Iceland Plateau, sediment reworking 334, 340, 342,
 343
 ICP-MS, isotopes, thorium dating 196
 Isfjorden Fan 38
- Kongsfjorden Fan 38
- Labrador Sea, grain-size characteristics, glacimarine
 sediments 306–308
 Laptev Sea 20–21
 large-scale morphology
 buried glacial horizons in Barents Sea: 3-D
 seismic data 259–277
 past ice-stream flow 245–259
 sediment delivery and slope form 11–32
 Last Glacial Maximum (LGM) 17
 Greenland Ice Sheet 149, 171–175
 Ross Sea 279
 Laurentian Fan 49
 Little Ice Age 367
 Lofoten Channel, sediment reworking 334–337, 342
- Macduff Slate Formation sequence, Southern
 Highland Group 131, 143–146
 Mackenzie Delta, Canadian Beaufort Sea 21
 magnetic susceptibility measurements 353
 Marine Isotope Stage transition MIS2–MIS3 351
 mathematical models, sedimentary dynamics in SE
 Alaska 197–206
 maximum glacial retreat surface 215
 Miocene, Early, glacimarine sedimentation, SW Ross
 Sea 105–128
 Miocene–modern records, Alaska 215–244
 models
 cryospheric processes and margin sedimentation
 comparisons 48–49
 Norwegian–Greenland Sea 46–48
 debris flows, granular *v.* visco-plastic 79–80
 fan development, Arctic continental slopes
 25–26
 glacial systems tracts 215, 217, 220, 232–240
 kaolin, shear mixing rates and processes 92–93
 sedimentary dynamics, high-resolution
 chronologies 197–206
 stratigraphic, temperate, glaciated continental
 shelves 215–244
 molybdenum, marine sediment cores, glacier surge
 periodicity 367–373

- moraines
 advance, retreat and re-advance sequence 218–219
 end-member processes 217
- North Atlantic, polar ice-sheet and sea-ice processes 33–54
- North Sea Fan 38–39, 55–71
 flow location and fan morphology 57–62
 geological setting 57
- Norwegian continental margin
 divergent-flow (ice-sheet) margin 20
 past ice-stream flow morphology 245–258
 bathymetry 249–253
 geological setting/seismic stratigraphy 247–250
 locations 253–256
 trough–mouth fans, Late Quaternary 55–72
- Norwegian–Greenland Sea
 erosional and depositional features 45–46
 ice-sheets and sea-ice 36–38
 sediment reworking 325–348
 bioturbation 339
 iceberg plough marks/furrows 339–340
 location map 326
 locations 329–339
 sediment cores **327**
 spatial variations and controls 340–342
- offshore drilling, SW Ross Sea 105–128
- Oligocene, Late
 and early Miocene
 SW Ross Sea 105–128
 facies analysis 112–121
 geological setting 111–112
- particle size measurements 351
- Pleistocene, Late, deep-marine sedimentation off
 NW Britain 129–148
- polar ice stream, Ross Sea 277–304
- Polar North Atlantic
 ice-sheet and sea-ice processes 33–54
 see also Arctic
- principal component analysis 314–317, **315**
- Prydz Bay Fan 49
- Quaternary, Late
 Kejser Franz Joseph Fjord, E Greenland 149–180
 Norwegian Sea margin 55–72
- Queen Charlotte Basin
 geological setting 183–188
 sea-level history 191–192
- radiocarbon measurements
 Barra Fan, calcium carbonate **353**, 354–355
 Canadian Pacific continental margin **186**
 Kejser Franz Joseph Fjord, East Greenland **154–160**
 X-radiographs 206–211
- reflectance measurements, colour variability 351,
 355–357
- retreat signature, polar ice stream, Ross Sea 277–304
- Reynolds number 99
- Richardson number 96–98
- Ross Ice Shelf, Crary Bank and Fan 49, 278
- Ross Sea
 glacimarine succession, grain-size characteristics
 and provenance 313–314, **315**
 Last Glacial Maximum (LGM) 279
 offshore drilling 105–128
 core data summary 110
 drill holes **106**
 drilling history 108–11
 locations 108
 Oligocene and early Miocene sedimentation
 111–121, **115**
 stratigraphy 121–12
 retreat signature of polar ice stream 277–304
 methods and results 279–294
 summary/discussion 294–301
- satellite synthetic aperture radar (SAR), Svalbard,
 Vestfonna ice cap 246
- Scandinavian Ice Sheet 245–258
- Scoresby Sund Fan 38–39, 90
 gravity cores 90
 sediment reworking 333–334, 340
- Scotland
 ice sheet dynamics, millennial scale variability in
 sediment colour 349–366
 Macduff Slate Formation sequence, Southern
 Highland Group 131, 143–146
- sea-ice processes, Polar North Atlantic 33–54
- sea-level changes, basins on Canadian Pacific margin
 181–194
- sedimentation
 Canadian Pacific margin 181–194
 colour millennial-scale variability, Barra Fan
 349–366
 and glacier-surge periodicity, E Greenland 367–373
 ice-proximal glacial marine sediments, grain-size
 characteristics and provenance 305–325
 molybdenum, E Greenland 367–373
 Norwegian–Greenland Sea
 models 46–48
 sediment reworking 325–348
 NW Britain, Late Pleistocene 129–148
 Ross Sea 105–128
 and slope form, Arctic continental slopes 11–32
 trough–mouth fans, Norwegian Sea margin 55–72
 W Shetland shelf, Late Pleistocene 129–148
- seismic data
 buried glacial horizons, Barents Sea 259–277
 facies architecture 230–232, **231**
 stratigraphy of past ice-stream flow, Norwegian
 continental margin 247–250
 W Shetland shelf, Late Pleistocene 140–142
- shear mixing rates and processes
 dilution of submarine debris flows 89–105
 experiments 89–105
- shear stress
 boundary of debris flow
 critical shear stress 94–95
 estimation 91
- Shetland, W Shetland shelf, Late Pleistocene
 sedimentation 129–148
 geological setting and borehole data 130–140
 integration with seismic data 140–142
 singular spectrum analysis (SSA) 205, 208

- Sklinnadjupet 247, 249–250, 252, 254
 slope form
 and sediment delivery, Arctic continental slopes 11–32
 submarine mass-wasting 73–88
 spectral analysis, Blackman–Tukey 207, 208, 356–358
 spectrophotometry, reflectance measurements 351, 355–357
 Storegga Slide 73, 78
 Storfjorden Fan 38–39, 256
 stratigraphic model
 temperate, glaciated continental shelf 215–244
 see also Alaska
 submarine channel systems 41–45
 submarine debris flows
 drag coefficient at boundary 91–92
 entrainment rate 101
 glacially-influenced continental slopes 73–88
 hydroplaning 80–81, 91–92, 100
 list of flows **75**
 mobility and runout 83–85
 models 79–80
 Norwegian Sea margin 55–72
 shear mixing rates and processes 89–105
 cohesive beds 94–97
 fluid mud gravity currents 97
 mixing processes 91–94
 summary/discussion 98–102
 slide areas 39–41
 see also glaciogenic debris flows (GDFs);
 trough–mouth fans
 submarine mass-wasting 73–88
 initial break-up 76–79
 list of slides **75**
 release mechanism 74–76
 sediment mass behaviour 77
 Suladjupet 247, 249–250, 252, 254
 surge-type glaciers, E Greenland, Mo records from
 marine sediment cores 367–373
 Svalbard, Vestfonna ice cap SAR 246
 temperate, glaciated continental margins
 stratigraphic model 215–244
 see also Alaska
 thorium dating 195–213
 Trænadjupet Slide 247, 249–251, 254
 sediment reworking 334–337, 342
 trough–mouth fans 73–88, 89–100
 debris flows and suspended sediments, Norwegian
 Sea margin 55–72
 growth patterns 65–67
 investigations 38–39
 see also submarine debris flows
 Vancouver Island 182
 Vesteris Seamount 42–43, 328, 340
 Vestfonna ice cap, satellite synthetic aperture radar
 (SAR) 246
 visco-plastic debris flow models 79–80
 Vøring plateau, sediment reworking 334–337
 Weichselian glaciations 37, 171–175, 245–258
 numerical-model reconstructions 255
 sedimentation rates 338
 Wisconsin Fraser glaciation 181–194
 X-radiographs, radioisotope calibration 206–211
 X-ray diffraction analysis 319
 Yakataga Formation, Alaska 215, **224**, 225
 seismic sequence architecture 230–232, **231**
 Yakutat, Guyot Glacier, Alaska 195, 200–201, 211
 Yermak Plateau, Barents Sea 268