

Cambridge University Press

978-0-521-88797-7 - Volcanic and Tectonic Hazard Assessment for Nuclear Facilities

Edited by C. B. Connor, N. A. Chapman and L. J. Connor

Index

[More information](#)

## Index

- R* statistical package, 355  
 $\phi$ , particle size, 239  
 $^3\text{He}/^4\text{He}$  indicator of magmatism, 104, 188, 196  
 $^{137}\text{Cs}$  in high-level waste, 31  
 $^{14}\text{C}$  age determination, 86, 233, 500  
 $^{222}\text{Rn}$  inhalation dose, 558  
 $^{226}\text{Ra}$  inhalation dose, 558  
 $^{39}\text{Ar}/^{40}\text{Ar}$  age determination, 86  
 $^{90}\text{Sr}$  in high-level waste, 31  
*a*-value, 268  
*b*-value, 268
- active tectonics, 60, *see* neotectonics, 492  
 adaptive kernel function, 354, 360  
 administrative law judge, 488  
 advection–diffusion equation, 236, 468  
 adventive cone, 350  
 aeromagnetic map, 459  
 age determination, 232, 573  
   fault slip, 500  
   reliability, 86, 312  
   volcano, 86  
 air-photos, 498  
 Akita-Komagatake volcano, 333  
 Akita-Yakeyama volcano, 333  
 aleatory variability, 262, 595  
 Aleutian earthquake, 282  
 alkaline basalt, 196, 430  
 Alligator Rivers region, 564  
 alluvial fan, 61, 120, 467  
 Alpine fault, 29  
 Alpine orogeny, 552  
 Amargosa Desert, 458  
 Amargosa trough, 198  
 Amargosa Valley isotopic province, 351  
 analog  
   experiment, 406, 430  
   ore deposit, 32, 556–557  
   volcano, 200, 465  
 anamorphosis function, 372  
 andesite, 87, 188  
   volcanism, 333  
 Andra, 521  
 annular flow, 410  
 antecedent drainage, 120  
 anticline, 119  
 Aosawa basalt, 14, 315  
 Aral Sea, 511  
 Armero, Colombia, 74–77  
 Arrhenian model, 87, 407  
 aseismic strain, 156  
 ash, *see* tephra, 232  
 ASHPLUME computer code, 468  
 asperity, 53  
 asteroid, 285  
 asthenosphere, 33  
 asymptotic mean integrated squared error, 355  
 atmospheric phenomenon, 586  
 Atomic Energy Commission, 10  
 atoms for peace, 1  
 Axial Volcanic Zone, 387
- backarc, 311, 332  
   basin, 308, 329  
 Backbone Range, 163, 169, 267, 313  
 ballistic projectile, 584–585  
 bandwidth, *see* kernel bandwidth  
 Bare Mountain fault, 198, 459  
 basalt, 87, 188  
 basaltic volcanic field, *see* volcanic field  
 Basin and Range, 83, 195, 351, 385  
 Bataan Lineament, 231  
 Bataan nuclear power plant, 11, 78, 229–231  
 batch partial melting, 203  
 Bayesian model, 336, 370  
 bentonite, 555  
 Beznau nuclear power plant, 598  
 BIFROST project, 145  
 Big Lost River fault, 386  
 Big Lost trough, 387

Cambridge University Press

978-0-521-88797-7 - Volcanic and Tectonic Hazard Assessment for Nuclear Facilities

Edited by C. B. Connor, N. A. Chapman and L. J. Connor

Index

[More information](#)*Index*

613

- bigaussian, 372
- biosphere dose conversion factor, 473
- bivariate Gaussian distribution, 353
- blast, 579–580
- Bodega Head, 9
- boiling-over eruption column, 250
- bolide impact, 285
- bootstrap, 234, 360
- borehole, 61, 532, 536
  - eruption through, 414
- Bouguer gravity anomaly, *see* gravity anomaly
- brecciation, 57
- brittle
  - crust, 53, 160
  - deformation, 540
- Buckboard Mesa, 198
- buoyancy force, 88, 201, 412, 460
- buried volcano, 349, 458
  
- caldera, 85, 232
- calibrated expert, 593
- California Department of Health Services, 488
- Cantonal referendum, 552
- capable volcano, 233, 570, 578
- Cape Mendocino earthquake, 129
- Cascadia subduction zone, 483, 597
- cataclasis, 57
- Cauchy kernel function, 359
- cementation, 53
- Cerro Negro volcano, 96
- Chaitén volcano, 86
- Charleston earthquake, 485, 597
- Chernobyl nuclear power plant, 1
- Chicxulub impact, 285
- Chilean earthquake, 31, 277
- Chin-shan nuclear power plant, 78
- Chokai-Kurikoma volcanoes, 312
- Choleski decomposition, 373
- Cigar Lake uranium ore deposit, 556
- Cima volcanic field, 458
- cladistics, 335
- climate change, 6, 142, 548
  - accelerated erosion, 123
  - coastal sites, 511–513
  - effect on volcanic hazard, 201
- co-disposal of waste, 555
- coastal sites, 509
- cognitive bias, 600
- Colima volcano, 101
- Colorado Plateau, 83
- Colorado River, 488
- comet, 285
- compaction, 53
- composite volcano, 83–85
  
- confining pressure, 51
- consequence analysis, 457
- convergence rate, 118
- coral microatoll, 121
- coseismic
  - displacement, 41, 158
  - uplift, 117
- Couette flow, 421
- Coulomb failure model, 246
- coupled nature of volcanic phenomena, 252, 578
- Cox process, 371–372
- Crater Flat, 459
- Crater Flat basalt, 198
- craton, 24, 147, 549
- credible hypothesis, 603
- Crowe, Bruce M., 455
- crust, 176
  - assessing horizontal motion, 63–65
  - assessing vertical motion, 65
  - continental, 53
  - ocean, 55
  - volcanic arc, 188
- crustal
  - strain rate, 257, 259
  - thinning, 117
- crystal, 87, 407
- cumulative distribution function, 376
  
- dacite, 88, 188
- damage to community infrastructure, 245, 298–299, 589
- data assimilation, 375, 381
- database, 600
  - active fault, 257, 266
  - earthquake, 349, 353, 597
  - geochemical, 201
  - geoscientific, 533, 597
  - global positioning system, 163
  - tsunami, 285–287
  - volcano, 329–332, 568–570, 573, 575–576
- Death Valley, 351
  - fault system, 356
- debris avalanche, 100, 581–582
- debris flow, 100, 467, 582–583
- decompression melting, 81
- defense in depth, 4–5, 17
- deformation
  - budget, 62–63
  - of the crust, 50–60
  - zone, 535–536
- degassing-induced crystallization, 408
- deglaciation, 143
- denudation, 119
  - rate, 551
- depleted uranium, 558

Cambridge University Press

978-0-521-88797-7 - Volcanic and Tectonic Hazard Assessment for Nuclear Facilities

Edited by C. B. Connor, N. A. Chapman and L. J. Connor

Index

[More information](#)

614

design basis, 264, 566  
 design-basis earthquake, 13  
 detachment fault, 27  
 detailed site investigation, 528  
 deterministic analysis, 236–242, 258, 486, 567, 578  
 deviatoric stress, 148  
 Diablo Canyon nuclear power plant, 10  
 diatrema, 467  
 differential subsidence, 397–399  
 diffuse deformation, 40–41, 56  
 dike, 88, 89, 188, 197, 350, 461, 536  
   polygenetic volcano, 309  
   propagation, 217, 432, 461  
   propagation model, 463  
   properties, 409, 429, 461–463  
   segment, 350  
   swarm, 218  
 dike–fault interaction, 460, 463  
 dike–repository interaction, 443  
 divergent margin, 25  
 dose limit, 455  
 Dounreay site, 516  
 downcutting river, 61  
 drift, *see* tunnel  
 Drigg low-level waste site, 517  
 drillhole, 459, *see* borehole  
 ductile  
   crust, 53  
   deformation, 539  
 dusty gas model, 464

Earth tide, 548  
 earthquake  
   aftershock, 45, 350  
   background, 260  
   cycle, 30–31, 47, 261  
   epicenter, 346  
   focus, 30  
   frequency, 48–49, 58, 260  
   glacial, 9  
   ground motion, 495  
   historical record, 50  
   hypocenter, 30  
   largest magnitude, 31  
   magnitude, 30–31, 260, 598  
   return period, 263, 494  
   rupture, 46, 598  
   volcano, 587–588  
   wave attenuation in the Earth, 30  
 earthquakes in Japan, influence on regulation, 492–494  
 East Africa rift, 37  
 eastern Snake River Plain, 385–391  
 EBR-1 reactor, 1  
 Eifel volcanic field, 101

*Index*

Eisenhower, President Dwight, 1  
 elastic  
   deformation, 167  
   half-space model, 160–161  
   strain, 41–47, 157–158  
 Eldfell volcano, 414  
 Electric Power Research Institute, 486, 595  
 electrical power generated, 1, 195, 492  
 electrical resistivity, 61  
 elevated basement, 313  
 elliptical kernel, 354  
 Eltanin impact, 285  
 emergency response, 589  
 empirical approach to evaluation of volcanic hazard, 307  
 endglacial fault, 146  
 energy cone, 94, 249, 580  
 engineered barrier system, 6, 406, 454, 551  
 engineering design, 264  
 Entsorgungsnachweis study, 554  
 Epanechnikov kernel function, 359  
 epistemic uncertainty, 169, 262, 595  
 ergodic assumption, 273  
 erosion, 116, 119–120, 548  
 eruption  
   column, 91  
   column height, 200, 232, 468  
   duration, 465  
   effusive, 90, 339  
   explosive, 91, 339  
   magnitude, 91–92, 594  
   mass discharge, 98, 223, 237  
   mass flow, 200–201  
   overview of effects, 94–101  
   volatile-poor magma, 430–431  
   volume, 594  
   volume flux, 458  
 eruption dynamics, 90–91  
 eruption scenario, 237, 413, 461, 568  
 eustatic sea-level change, 120  
 evaluator, 603  
 event definition, 359  
 excavation damage zone, 542  
 exceedance probability, *see* probability of exceedance  
 exclusion zone, 332  
 exhumation rate, 122  
 expert  
   assessment, 600–608  
   elicitation, 262, 455, 574, 588, 593  
   NRC guidelines, 598  
   judgment, 346  
   training, 603  
 extreme events  
   bolide impact, 285  
   coastal sites, 518–519

- earthquake, 31
  - sedimentation, 510
  - volcanic, 83
- Factor of Safety, 247
- failed rift, 147
- FAR computer code, 468
- fault, 27–30
  - active, 14, 43, 157, 261
  - active, investigation of, 497–502
  - branch, 60
  - classification of slip rate, 43, 494
  - creep, 159
  - displacement, 257, 261
  - glacial, 9, *see* glacially induced faulting
  - hidden, 157, 265
  - maximum magnitude, 260
  - reactivation, 142
  - rupture, 46, 258, 481
  - scarp, 401
  - slip, 45, 161
    - syn-intrusive, 463
  - splay, 53
  - zone, 58, 503, 538
- Fennoscandian ice sheet, 143
- Fennoscandian shield, 535
- fission track age determination, 232
- fissure-fed eruption, 466
- flexural deformation, 503
- flexure, 398
- flood, 582–583
- flood basalt eruption, 410
- flow strength, 50
- fluvial process, 119
- fold, 56, 60, 157
- foliation, 535
- foot-wall, 119
- fore-Alps, 552
- forebulge, ice sheet, 143
- forecasting
  - uplift rate, 122–123
  - volcanic activity, 102–107, 326–328
- Forsmark site, 530
- fractional crystallization, 201, 203
- fracture
  - strength, 50
  - toughness, 218
- fragmentation, 91, 200, 219
- Fukouzu fault, 25, 501
- Fukuoka-ken earthquake, 493
- Gösgen nuclear power plant, 598
- gamma distribution, 377
- gamma dose, 557
- gas segregation in magma, 416
- Gaussian kernel function, 337, 354, 393
- Gaussian space, 372
- geochemical data for volcano hazard assessment, 576–577
- geochemical model, 543
- geochemistry, 196
- geodetic
  - levelling, 144
  - surveying methods, 121
- geographic information system, 603
- geoid, 120
- geological map, 573
- geological repository, 6, 195
  - climate change, 143
  - effect on dike propagation, 463
  - erosion scenario, 559
  - fault, 45, 57, 502–503
  - glacial unloading, 527
  - in subduction zone, 549–550
  - magmatic disruption, 196, 307, 326, 406–407, 429–433, 461–468
  - operational lifetime, 7, 9, 32, 195, 308–309
  - radiation dose in comparison with background values, 559–560
  - radiological risk, 7
  - sea-level change, 519–520
  - tectonic hazards, 43–50
  - uplift and subsidence, 548–549
- geomorphologic marker horizon, 61, 121–122
- GEONET, 42, 63, 163
- geophysical
  - anamorphosis, 377
  - data for volcano hazard assessment, 576–577
  - methods, 105, 458, 499–500, 532
  - fault characterization, 61
  - model, 365, 370
- geoscientific model, 497
- geosphere–biosphere interface, 555
- geothermal fluid, 588
- Gibbs sampler, 372
- glacial
  - cycle, 119
  - isostatic adjustment, 142
  - loading, 20, 142, 548
  - maximum, 143
  - maximum rebound, 144
  - rebound model, 146
  - uplift, 535
- glacially induced faulting, 146–151
- glaciation
  - effects of repeated, 559
- global plate motion model, 36, 163

Cambridge University Press

978-0-521-88797-7 - Volcanic and Tectonic Hazard Assessment for Nuclear Facilities

Edited by C. B. Connor, N. A. Chapman and L. J. Connor

Index

[More information](#)

616

global positioning system, 32, 41–42, 103, 257  
 continuous, 156  
 measurement, 158–160  
 network, 42  
 overview, 156–158  
 uncertainty, 163–164

GMFIX computer code, 413

GPS, *see* global positioning system

graben, 119

grain-size distribution, 236, 243

Grand Banks tsunami, 282–283

gravity  
 absolute measurement of, 146  
 anomaly, 179, 311, 314, 349, 382

Great Sumatran earthquake, 4, 24, 41, 280–281

Greenwater Range, 351

ground deformation, 234, 586–587

ground motion, 260, 594  
 unbounded, 263

ground-penetrating radar, 61

ground rupture, 30

groundwater, 588  
 contaminant plume, 472  
 contamination, 485–486  
 fast pathway, 529  
 oxidation, 556  
 pathways for radionuclide transport, 196  
 radionuclide transport, 454

Gutenberg–Richter relationship, 260, 293–294

HABOG spent fuel facility, 6

hanging wall, 60, 117, 388

Hanshin earthquake, 29

hazard curve, 243, 261, 263, 594

hazard map, 107, 349, 380

Headquarters for Earthquake Research Promotion, 493

Heise volcanic field, 399

Hekla volcano, 88

Hele–Shaw cell, 433

Henry's law, 409

Hidden Cone volcano, 198

high-level waste, 6, 552  
 US inventory, 429

high-level waste repository, *see* geological repository

Hokkaido-Nansei-oki earthquake, 126, 493

Hokkaido-Toho-oki earthquake, 493

Holocene, 567

homogeneous Poisson model, 369

Hood volcano, 179

hot fingers, 178–182, 316, 374

hot-spot volcanism, 35, 81, 386

Humboldt Bay nuclear power plant, 483–484

hydrogeologic model, 541

Index

hydrogeology, 481

hydrothermal alteration, 538

hydrothermal system, 232, 463

hydrovolcanic eruption, *see* phreatomagmatic eruption

Hyogo-ken Nanbu earthquake, 13, 127, 493

hyperconcentrated flow, 248

ice  
 history, 149  
 loading, 535, 550  
 sheet  
 continental, 142  
 model, 150

Ichinose fault, 504

Idaho National Laboratory, 5, 78, 385, 485

igneous  
 effects abstraction, 470–472  
 event, 430

ignimbrite, 198, 452

Iide Mountains, 181, 316

independent event, 343, 350

Indian Ocean tsunami, 276, 280–281

inertial force, 410

inhalation of aerosols, 473

initial site investigation, 528–529, 571–573

INTEC facility, 390

interferometric synthetic aperture radar, 103, 121

intermediate-level waste, 6, 552

International Atomic Energy Agency, 1, 14, 230, 566  
 dose intervention level, 558  
 Safety Series, 3, 566

international geomagnetic reference field, 459

international terrestrial reference frame, 163

interseismic  
 coupling, 159  
 strain, 259

intraplate seismicity, 352

intrusion, 81, 89, 197, 419  
 nose region, 432

isomass map, 239

isopach map, 239, 389

isostasy, 39, 65, 116, 142, 535, 550

isostatic rebound, 550

Itoigawa–Shizuoka tectonic line, 504

Iwate volcano, 333

Izu–Bonin arc, 176

Jabiluka mine site, 562

Jackass Flat, 198, 459

Japan Agency for Marine–Earth Science and  
 Technology, 178

Java earthquake, 279

Jefferson volcano, 179

joint, 57, 538

Cambridge University Press

978-0-521-88797-7 - Volcanic and Tectonic Hazard Assessment for Nuclear Facilities

Edited by C. B. Connor, N. A. Chapman and L. J. Connor

Index

[More information](#)*Index*

617

- K/Ar age determination, 232  
 Kalpakkam nuclear power plant, 4  
 Kaluzny, Y., 521  
 kaolinitization, 539  
 Kashiwazaki–Kariwa nuclear power plant, 14–16, 493  
 Katmai volcano, 237  
 kernel  
   bandwidth, 354, 360, 393  
   bandwidth matrix, 354, 393  
   bandwidth selector algorithm, 393  
   bandwidth threshold, 337–338  
   density estimate, 337, 353–358  
   density estimation, 393  
 Kikai caldera, 124  
 Kilauea volcano, 88, 410  
 Kilbourne Hole volcano, 202  
 Kobe earthquake, 29, 493  
 Koolau volcano, 281  
 Kozloduy nuclear power plant, 10  
 Krafla volcano, 88, 414  
 Krakatau volcano, 284–285  
 kriging variance, 373  
 Kurile basin, 308  
 Kushiro-oki earthquake, 493
- La Manche waste site, 521  
 Laacher See volcano, 101  
 lahar, 75, 100, 582–583  
   inundation, 246  
   source region, 245–249  
   volume, 247  
   volumetric discharge, 75  
 LAHARZ computer code, 246  
 laminar flow, 410  
 Lamington volcano, 86  
 Landers fault, 505  
 landslide, 281–282, 581–582  
 Lansjärv fault, 151  
 lapilli, 232, 467  
 Lathrop Wells volcano, 198, 351, 407, 455  
 Laurentide ice sheet, 143  
 lava  
   bocca, 462  
   dome, 90  
   flow, 98, 200, 389, 419, 580–581  
   flow architecture, 390  
   tube, 419  
 Lawrence Livermore National Laboratory, 594  
 Laxemar site, 530  
 Leibstadt nuclear power plant, 598  
 lightning, 586  
 linear accelerator, 548  
 liquidus, 408  
 literature search, 497–498, 527, 572
- lithosphere, 33  
 lithospheric mantle, 460  
 lithostatic pressure, 409  
 Little Black Peak volcano, 198  
 Lituya Bay landslide, 277, 281  
 loess stratigraphy, 132  
 log-logistic, 234  
 logic tree, 262, 603  
 Loma Prieta earthquake, 29  
 low velocity zone, 180, 314, 401  
 low-level waste, 482, 552  
 luminescence dating, 132  
 Lunar Crater volcanic field, 202, 458
- maar, 101, 202  
 magma  
   bimodal, 186  
   bubbles in, 87, 407  
   compressible flow, 219  
   cooling, 418–419  
   decompression, 411–413  
   density, 87, 407  
   discharge rate, 90  
   enthalpy of crystallization, 218  
   flux, 409  
   foam, 416  
   heat capacity, 218  
   production, 386, 458  
   solidification, 219  
   temperature, 88  
   thermal diffusivity, 417  
   time-dependent viscous flow, 430  
   two-phase flow, 410–411  
   underplating of crust, 311  
   viscosity, 87–88, 407  
   volatile-poor, 430  
   volatiles, 208, 220, 407  
 magma ascent, 86–90, 214–223, 350  
   rate, 88, 410–411  
 magma generation, 86, 176, 201–210, 350  
   pressure, 211–212  
 magmatic event, 350  
 magmatism  
   spatial variation, 390–391  
 magnetic  
   anomaly, 198, 359, 459, 535, 599  
   polarity reversal, 33  
 magnetotellurics, 61, 104  
 Manhattan project, 1  
 mantle  
   aqueous fluid, 86, 187  
   convection, 186  
   plume, 81, 187  
   viscoelastic, 150

Cambridge University Press

978-0-521-88797-7 - Volcanic and Tectonic Hazard Assessment for Nuclear Facilities

Edited by C. B. Connor, N. A. Chapman and L. J. Connor

Index

[More information](#)

618

mantle (*Contd.*)  
 viscosity, 143, 150  
 wedge, 186–187, 310–311  
 Mariana arc, 177  
 marine terrace, 61, 121–123, 502  
 morphology, 127  
 marine transgression, Holocene, 124  
 Mariveles volcano, 231  
 Markov model, 370  
 Marlborough earthquake, 44  
 Martinsville low-level waste site, 482–483  
 maximum horizontal compressive stress, 429  
 mechanical erosion by magma, 414  
 median clast diameter, 238  
 melt, 87, 407  
 metamorphism, 539  
 Metsamor nuclear power plant, 10, 78  
 Mg #, 210–211  
 microseismic network, 535  
 middle crust, 186  
 migmatite, 538  
 Milankovitch cycle, 548  
 mine tailings, 562  
 Miyagiken-oki earthquake, 13, 164  
 Miyake-jima volcano, 188  
 monogenetic volcano, 85, 350, 385, 430, 452  
 Monte Carlo, 169, 242, 347, 361, 373, 456  
 MOST computer code, 289  
 motivational bias, 600  
 Mount St Helens, 4  
 Mühleberg nuclear power plant, 598  
 Mülheim-Kärlich nuclear power plant, 78, 101  
 multivariate potential, 372  
 Muria nuclear power plant site, 78

Nagano-ken Seibu earthquake, 493  
 Nagra, 530, 598  
 nanostrain, 41  
 Napot Point, 229  
 Natib volcano, 230  
 eruption history, 232–233  
 National Center for Environmental Prediction, 239  
 National Research Council, 488  
 nationwide evaluation factor, 309, 545  
 natural barrier system, 406, 454, 550  
 Neodani fault, 506  
 neotectonics, 60–63  
 Nevada Test Site, 195  
 Nevado Del Ruiz volcano, 74–77  
 New Madrid earthquake, 48, 597  
 Nihonkai Chubu earthquake, 493  
 Niigata-Chuetsu-oki earthquake, 493  
 Niigata-ken Chuetsu earthquake, 493  
 Nirex, 528

*Index*

non-ergodicity, 264  
 non-homogeneous Poisson model, 369  
 non-stationary, 332, 369  
 non-parametric method, 347  
 normal fault, 27, 118, 452  
 northern hemisphere ice sheets, 143  
 Northridge earthquake, 157  
 Noto-hanto-oki earthquake, 127, 493  
 nuclear power plant  
 advanced boiling water reactor, 12  
 construction, 2, 195  
 decommissioning, 483  
 hazard rate, 574  
 locations, 3  
 operational lifetime, 6  
 triggered shutdown, 11, 589  
 nuclear reactors, research, 2  
 nuclear renaissance, 1  
 nuclear test-ban treaty, 2  
 Nuclear Waste Management Organization of Japan, 19, 309,  
 326, 528  
 nugget effect, 379  
 Nusselt number, 219  
 NUVEL-1A, 39

Oberbauenstock site, 552  
 oblique-slip fault, 29  
 ocean  
 basin, 119  
 trench, 33, 176  
 ocean-bottom seismograph, 178  
 Oklo uranium ore deposit, 556  
 Olkiluoto repository site  
 characterization, 535–543  
 tectonic stability, 534–535  
 Omori's law, 47  
 Onagawa nuclear power plant, 13  
 ONKALO, 535  
 Opalinus Clay, 530, 554  
 open-pit mine, 562  
 ore deposit, 529  
 Osamu Utsumi uranium deposit, 557  
 oxygen fugacity, 202

Pärvie fault, 147  
 Pacific Gas and Electric, 9  
 Paintbrush Canyon fault, 459  
 paleoenvironmental reconstruction, 124  
 paleoseismology, 259, 598  
 paleoshoreline, 122, 144  
 paleotsunami, 286–287  
 Pangea project, 549  
 Parícutin volcano, 85

- parallel
  - computer, 362
  - processing, 346
- parametric model, 353
- parasitic cone, 350
- partial melt, 86, 187, 201
- particle diameter, 236
- passive continental margin, 147
- peak ground acceleration, 258, 483
- peak strength, 50
- pediment, 61
- PEGASOS, 11, 487, 598–599
- penPLAIN, 61
- percolative flow, 214
- performance assessment, 196, 454–455, 486
- peridotite, 201, 205
- petrogenesis, 196
- petrogenetic model, 460
- petrology, 196
- phase equilibria, 201
- Philippine Atomic Energy Commission, 230
- Philippine Institute of Volcanology and Seismology, 232
- phreatomagmatic eruption, 200, 467
- pilot bandwidth, 355
- Pinacate volcanic field, 431
- Pinatubo volcano, 11, 231
- plate motion budget, 161
- plate tectonics
  - global plate motion model, 37
  - overview of plate motion, 32–34
  - rates of plate motion, 35–37
- Plinian eruption, 95
  - Mt. Pinatubo, 231–232
- pluton, 89, 185
- plutonium, 488
- pMELTS computer code, 201
- Poiseuille flow, 421
- Poisson process, 105, 234, 261, 338, 600
- pole of rotation, 36, 158
- polygenetic volcano, 85, 333, 374
- pore pressure, 51
- porosity, 53
- Posiva, 534
- postglacial fault, 147
- postseismic displacement, 159
- potential of volcanism, 370
- precautionary principle, 339
- preliminary investigation area, 309, 545
- pressurized water reactor, 1
- probabilistic
  - analysis, 242–245, 457, 567, 578
  - fault displacement hazard assessment, 261
  - seismic hazard assessment, 11, 258–261, 346–347, 487
  - role of GPS, 169–170
  - tectonic hazard assessment, 257
  - tephra hazard map, 245
  - tsunami hazard assessment, 290–299
  - volcanic hazard assessment, 18, 105–107, 229, 346–347, 370, 455
- probability of exceedance, 14, 243, 260
- probability-weighted dose, 455
- Project Gewähr, 552
- proponent, 603
- Pululagua volcano, 96
- pyroclast, 74, 219
  - incorporation of radioactive waste, 468
- pyroclastic
  - density current, 98
    - hazard estimate, 249–251
  - flow, 98, 465, 579–580
  - surge, 98, 579–580
  - vent facies, 462
- radiation dose, 552, 554, 557
  - background, 558, 562
- radiation dose analysis, 472–473
- radioactive waste transport, 482
- radionuclide
  - concentration, 468
  - surficial transport, 472
  - transport, 418, 466, 550
  - saltation, 421
- Radium Hill ore deposit, 563
- radon, 473
- random intensity function, 371
- random variable, 347
- range-front fault, 386
- Reanalysis project, 239
- reasonably maximally exposed individual, 454
- recirculation of magma in repository, 417
- recurrence rate
  - earthquake, 157, 258, 598
  - eruption, 252
  - regional volcanism, 333–334
  - volcano, 86, 234, 349, 385, 460, 573
- regional extension, 460
- regulation
  - coastal sites, 521–522
  - expert assessment, 594
  - risk-informed approach, 13
  - seismic hazard, 11–12, 487, 494–497
  - volcanic hazard, 4, 10–11, 454, 566
- releases from coastal facilities, 510
- residual risk, 494
- respect distance, 152
- restitute, 188
- reverse fault, 27, 117, 147, 157
- Reynolds number, 236, 410, 432



Cambridge University Press

978-0-521-88797-7 - Volcanic and Tectonic Hazard Assessment for Nuclear Facilities

Edited by C. B. Connor, N. A. Chapman and L. J. Connor

Index

[More information](#)

620

Rhine Graben, 81  
 Rhine river, 554  
 Rhine/Scheldt delta, 512  
 rhyolite, 83, 188  
 rift, 35, 55, 81  
 Ring of Fire, 24, 81  
 rock  
   alteration, 466  
   deformation, 156, 169  
   mechanics, 541  
 Rokkasho nuclear fuel cycle center, 5, 509

Sakurajima volcano, 512  
 San Andreas fault, 9, 29, 37  
 San Carlos volcanic field, 202  
 San Francisco earthquake, 24  
 San Onofre nuclear power plant, 489  
 Santorini volcano, 86, 284  
 Satsop nuclear power plant, 597  
 scientific assessment, 606  
 scoria cone, 85, 459, 583  
 scour depth, 468  
 screening  
   criterion, 309  
   distance, *see* volcanic hazard  
   distance estimation, 235–251  
 sea-level  
   change, 548, 550  
   curve, 123  
   maximum rise, 513  
 seafloor spreading, 33  
 sector collapse, 281  
 sedimentation  
   coastal sites, 515–516  
 seiche, 585–586  
 Seihou-oki earthquake, 493  
 seismic  
   acceleration, 497  
   attenuation, 261, 496  
   catalog, 257  
   coupling, 598  
   design, 598  
   hazard map, 258  
   performance analysis, 264  
   profile, 183  
   reflection, 61, 184, 499  
   survey, 122  
   swarm, 88  
   tomography, 82, 104, 179, 311, 349, 371, 401  
   velocity model, 184  
 seismogenic source, 598  
 Sellafield nuclear reprocessing facility, 517

*Index*

Senior Seismic Hazard Analysis Committee, 169, 595  
 Senya fault, 169  
 shallow-water wave velocity, 277  
 shear zone, 58, 529  
 shear-wave splitting, 187  
 shield volcano, 83–85  
 Shields number, 421  
 Shikoku basin, 308  
 shock  
   amplification, 413  
   tube experiment, 464  
 sidescan-sonar, 499  
 Sierra Blanca site, 488–489  
 sill, 89, 197, 398, 419, 461  
 site  
   descriptive model, 527, 530–534  
   investigation strategy, 527, 571  
   region, 347, 571  
 site-specific evaluation factor, 545  
 slab-rollback, 119  
 slickensides, 540  
 slope failure, 581–582  
 smoothed  
   asymptotic mean integrated squared error, 355  
   bootstrap, 346, 360  
   cross-validation, 355  
 Snake River Plain aquifer, 389  
 solidus, 79, 205, 408, 460  
 sorting, 238  
 Soufrière Hills volcano, 249  
 source geometry, 594  
 Southeast Crater Flat, 198  
 Southwest Nevada volcanic field, 455  
 Southwestern Compact, 487  
 sparse event data, 360–362  
 spatial  
   correlation, 378  
   density, 332, 346–348  
   density estimate, 348–350  
   distribution of volcanoes, 393–397, 401  
   intensity, 332, 347–348  
   statistics, 348  
 Speckle, 4  
 spent fuel, 552  
 spherical variogram model, 379  
 Spitak earthquake, 10  
 stationary, *see* non-stationary  
 statistical structure, 350  
 steady-state magma flow, 414  
 stick-slip, 159  
 stochastic  
   assessment of seismic hazard, 497  
   model, 369–370  
   point process, 343, 348, 370

- Stokes settling, 421
- storm surge  
coastal sites, 515
- strain, 41, 265  
areal, 167  
map, 266  
rate, 62–63, 157, 265  
residual, 161, 267
- stratigraphic correlation, 251
- stream erosion, 553
- stress  
differential, 51, 148  
rotation, 463
- striation, 58
- strike-slip fault, 27, 505
- Stromboli  
landslide, 281  
volcano, 418
- Strombolian eruption, 418, 466
- strong motion, 261
- structural contour map, 389
- sub-Plinian eruption, 237
- sub-sea disposal of radioactive waste, 550
- subduction, 24, 81, 176–177
- subsidence, 116, 548  
coastal sites, 517–518  
local, 119  
regional, 118–119
- Sumatra-Andaman Islands earthquake, *see* Great Sumatran earthquake
- Sumisu caldera, 186
- surface wave, 30
- Swiss Federal Nuclear Safety Inspectorate, 598
- syncline, 119
- Taber caldera, 395
- Taiwan earthquake, 484
- Tambora volcano, 237
- Tangshan earthquake, 30
- technical integrator, 596
- tectonic plate  
major, 36, 158  
microplate, 36  
minor, 36  
speed, 158  
subplate, 36
- tectono-magmatic setting, 385
- tephra, 95, 200, 467  
density, 238  
deposit erosion, 246  
remobilization, 467
- tephra fallout, 578–579  
hazard estimate, 235–245
- TEPHRA2 computer code, 236
- terrace aggradation, 61
- Test Area North facility, 390
- Test Reactors Area, 395
- Texas Natural Resource Conservation Commission, 488
- thermal  
erosion by magma, 414  
springs, 232  
subsidence, 313
- thermochronology and estimation of uplift, 122
- Thirsty Mesa basalt, 198
- Three Sisters volcano, 104, 179
- thrust fault, 29, 504
- tilt, 267
- Timber Mountain caldera, 198, 455
- titanium drip shield, 454
- Tohoku  
estimate of volcanic hazard, 380–381  
estimate of volcano spatial density, 374–380  
strain rate, 158  
tectonic hazard, 162–163, 257  
tectonic hazard assessment, 264–272  
volcanic arc, 82, 329  
volcano distribution, 311–313, 370
- Tokachi-oki earthquake, 160, 164
- Tokyo earthquake, 24
- Tongariro volcano, 86
- topographic  
barrier to flow, 249  
data, 498  
lineaments, 498
- Torishima volcano, 178
- total system performance assessment, *see* performance assessment
- Tottori-ken Seibu earthquake, 13, 493
- trace element geochemistry, 213–216
- transform margin, 24
- Trawsfynydd nuclear power plant, 361
- trench,  
paleoseismic, 61  
paleoseismology, 500–502, 602
- Trojan nuclear power plant, 78
- tropical storm, 589
- tsunami, 276  
bolide impact source, 285, 512  
causes, 278–285  
coastal sites, 513–515  
earthquake source, 279–281  
landslide source, 281–283  
meteorological, 279  
numerical model, 287–290  
volcano source, 97, 283–285, 585–586  
wavelength, 277

Cambridge University Press

978-0-521-88797-7 - Volcanic and Tectonic Hazard Assessment for Nuclear Facilities

Edited by C. B. Connor, N. A. Chapman and L. J. Connor

Index

[More information](#)

622

tunnel  
 backfill, 554  
 magma flow in horizontal, 433  
 repository, 406, 464  
 turbidity current, 282  
 turbulent flow, 410  
 turning bands method, 373

Ubehebe maar, 351  
 UK earthquakes, spatial distribution of, 351–353  
 uncertainty, 252, 262, 346, 358, 370, 484–487, 593  
 volcanic events, 570–571  
 uniform random distribution, 242, 353  
 Union of Concerned Scientists, 230  
 Unzen volcano, 97, 284  
 uplift, 116, 267, 548  
 coastal sites, 517–518  
 local, 117–118  
 measuring rates of, 120–122  
 regional, 117

uranium  
 concentration in groundwater, 563  
 concentration in surface water, 563  
 ore deposit, 31, 556–557, 561  
 weathering, 556

US Department of Energy, 196, 385, 452, 486, 595  
 US Nuclear Regulatory Commission, 17, 196, 230, 452, 595  
 US Nuclear Waste Technical Review Board, 484

vadose zone, 466  
 variogram, 376  
 Vatnajökull glacier, 143  
 vein, 57  
 vent, 467  
 alignment, 350  
 new, 101, 346, 374, 583–584  
 ventilation shaft, 464  
 very long baseline interferometry, 39  
 Vesuvius volcano, 24  
 vibratory ground motion, 481  
 violent Strombolian eruption, 466  
 viscosity, 52  
 non-Newtonian, 88  
 viscous  
 dissipation, 435  
 force, 410  
 vitrified waste, 31  
 volcanic  
 arc, 176, 307  
 conduit, 87, 309, 461  
 edifice, 329–331  
 event, 327, 369, 456–457, 567  
 field, 85, 386, 429, 457–461  
 front, 310

*Index*

gas, 585  
 plume, *see* eruption column  
 rift zone, 385  
 risk assessment framework, 455–456  
 volcanic hazard  
 assessment methodology, 571  
 distal, 94, 235  
 guidelines for evaluation, 566–567  
 proximal, 94, 235  
 screening distance, 577–578  
 volcanism, plate tectonic setting, 80–83  
 volcano, 83  
 active, 85–86, 567  
 assessment of capability, 233–235  
 cluster, 106, 179, 307, 310–311, 350, 370, 457  
 definition of, 332–335  
 dormant, 85, 234  
 extinct, 85, 327  
 formation of new, 85, 308, 327  
 Holocene, 86, 567  
 Holocene(?), 574  
 monitoring, 102–105, 251  
 stratigraphy, 385  
 timespan of activity, 308  
 volcano deformation, 102  
 Volcano explosivity index, 91–92, 234  
 volcano seismology, 102  
 volcano-tectonic earthquake, 233

Wadati–Benioff zone, 34  
 Wairarapa fault, 31  
 Ward Valley, 487  
 Waste Isolation Pilot Plant, 484  
 waste package, 454  
 damage, 414, 465  
 displacement by magma, 420  
 thermal stress, 420  
 water runoff model, 246  
 wavelength  
 geophysical anomalies, 178  
 topography, 134, 313–314  
 Weart, Wendell, 484  
 Webb, 6  
 Wegener, Alfred, 32  
 wehrlite, 218  
 Weibull–Poisson model, 369  
 Weichselian ice sheet, 150  
 Wellenberg site, 552  
 wind velocity, 239  
 Windy Wash fault, 459  
 WISE calculator, 558  
 Worldwide Standardized Seismograph Network, 3  
 Wylfa nuclear power plant, 361

Cambridge University Press

978-0-521-88797-7 - Volcanic and Tectonic Hazard Assessment for Nuclear Facilities

Edited by C. B. Connor, N. A. Chapman and L. J. Connor

Index

[More information](#)*Index*

623

xenolith, 202, 218

Yellowstone caldera, 386

yield strength, 39, 47, 55, 88, 218

Yucca Mountain, 18, 78, 195, 598

GPS, 156

license application, 452

magmatic disruption, 406

natural barrier system, 484

probabilistic seismic hazard analysis, 598

probabilistic volcanic hazard assessment, 599–600

repository design, 431

tectonic hazards, 43

uncertainty in risk assessment, 486

volcanic risk assessment, 452

volcano distribution, 197–200, 347, 351

volcano recurrence rate, 369–370

zeolite, 454