

INDEX

- AAUs, in Kyoto Protocol, 65–66
 ability to pay principle, 129
 Acts of God, 1
 Ad Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol, 67
 Ad Hoc Working Group on Long-term Cooperative Action under the Convention, 67
 Ad Hoc Working Group on the Durban Platform for Enhanced Action, 78–79
 Adaptation Committee, 75
 Adaptation Fund, 74
 Adaptation Registry, 95
 adaptation responses, to climate disasters (Climate Change Adaptation (CCA)). *See also* multi-level governance approaches, to climate change
 in Australia, 202–206
 barriers to, 168–169
 decision-making context for, 165–166
 defined, 156–157
 differential risks in, 161–162
 EEA approach to, 168–177
 electricity technology in, 220–221
 in EU, 198–201
 future applications of, 166–167
 Green Infrastructure Strategy, 163–165
 insurance as, 169
 IPCC evaluation of, 160–169
 land use planning as, 233–234
 marine spatial planning, 198–201
 multi-agency adaptation governance, 172–177
 in Philippines, 196–197
 in prevention strategies for climate disasters, 156–160
 relocation and resettlement strategies, 225–226
 risk management in, 166–168
 transformational, 158–160, 163–165
 transition form of, 158–159
 for urban areas, 231–234
 in U.S., 172–177
 adaptation tipping points (ATPs), 178
 adaptive capacity, 134–139, 178, 227–228, 231–233
 adaptive law, 179–184
 Coastal Protection Act 1979 and, 183
 constitutionality of, 184
 courts in, 181
 development consents under, 183–184
 goals in, 180
 landowners under, 181–183
 Local Government Act 1993 and, 183
 methods in, 180
 processes in, 180
 social-ecological resilience approach to, 178–179
 Stop the Beach Nourishment Inc v. Florida Department of Environmental Protection and, 184
 structure of, 180
 Vaughan v. Byron Shire Council under, 181–183
 The Advancement of Sound Science Centre (TASSC), 18
 AEP. *See American Electric Power v. Connecticut*
 AFOLU. *See* agriculture, forestry and other land use
 Africa, 142, 148

- African Americans, 240. *See also*
 Hurricane Katrina
- AGDRP. *See* Australian Government
 Disaster Recovery Payment
- Agenda 21, 54, 56–58
 atmospheric protections under, 57–58
 energy efficiency under, 58
- agriculture, forestry and other land use
 (AFOLU), 89
- AILAC. *See* Association of Independent
 Latin American and Caribbean
 States
- Algeria, 248
- Alliance of Small Island States
 (AOSIS), 59
- Amazon rainforests, 24
- American Electric Power v. Connecticut*
 (AEP), 328–330
- American Petroleum Institute, 17–19
- AMOC. *See* Atlantic Meridional
 Overturning Circulation
- Antarctic ice sheet, 42
- Anthropogenic attribution, to climate
 change, 47, 85
- AOSIS. *See* Alliance of Small Island
 States
- AR4. *See* Fourth Assessment Report
- AR5. *See* Fifth Assessment Report
- asbestos damage. *See* James Hardie Fund
- assigned amount units. *See* AAUs
- Association of Independent Latin
 American and Caribbean States
 (AILAC), 59–60
- Atlantic Meridional Overturning
 Circulation (AMOC), 41
- atmospheric concentration levels, 85
- atmospheric protection, under Agenda
 21, 57–58
- ATPs. *See* adaptation tipping points
- attack science, 13
 tobacco industry and, 13
- Australia
 AGDRP in, 264
 bushfires in, 221–223
 carbon price mechanism in, 340
 climate scepticism, 10
 climate science in, political
 interference with, 30–32
 coastal planning principles in, 203–204
 Coastal Protection Act 1979 in, 183
 conservative Coalition government
 in, 30–31
 CSIRO Climate Adaptation Flagship
 in, 31–32, 205–206
 disaster relief funds in, 264–266
 extreme heat in, 151
 flood insurance in, 307–311
 Insurance Contracts Amendment
 Act in, 310–311
 James Hardie Fund in, 337
 Local Government Act 1993 in, 183
 NDIR in, 307–311
 NDRRA in, 265–266
 Queensland floods in, 209–215
 ratification of Kyoto Protocol, 127–128
 Sale of Land Act in, 222
 temperature change in, 40
Vaughan v. Byron Shire Council in,
 181–183
 Victorian bushfires in, 151
 withdrawal from Kyoto Protocol, 63
 Australian Government Disaster
 Recovery Payment (AGDRP), 264
- Bali Action Plan (2007), 67
- Bangladesh
 civil society and, 357
 EWS and, 245–246
 limits of adaptation and, 195
- Bayesian methods, in AR5, 35
- Bellwin Scheme, 263
- beneficiary pays principle, for Climate
 Justice, 130–131
- Biggert-Waters Flood Insurance
 Reform Act of 2012, 304–307
- biogeochemical cycles, 45
- boundary organisations
 EEA and, 352
 public reasoning and, 350–352
- Brundtland Report, 52–53. *See also* *Our
 Common Future*
- building codes, 222
- bushfires, 146–147
 in Australia, 221–223
 building codes and, 222
 Bushfire Attack Level and, 222

- bushfires (cont.)
 - Bushfire Flame Zone and, 222
 - bushfire-prone areas and, 222
 - land use and planning for, 221–222
 - risk assessment and, 221–222
 - vegetation clearing strategies, 223
- Canada, withdrawal from Kyoto Protocol, 99–100
- Cancun Adaptation Framework, 74–76
- Cancun Agreements (2010), 58–59, 70
 - NAMAS under, 71–72
 - REDD+ and, 73
 - sectoral approaches to, 73–74
- Capability Approach
 - climate disasters and, 139
 - Climate Justice and, 105–110
 - to disaster law, 106–110, 134–139
 - humans and non-humans and, 110
- carbon budgets, 50
- Carbon Capture and Storage (CCS), 87–88
- carbon cycles, 45
- carbon dioxide (CO₂), 37–38, 45, 63.
 - See also* greenhouse gas emissions
- Carbon Dioxide Removal (CDR)
 - methods, 39–40
- carbon price mechanisms (CPMs), 340, 342–343
- Catastrophe Bonds, 301–302
 - MetroCat Catastrophe Bond and, 280
- catastrophe funds, 256
- catastrophic risk, 295
- CBDR principle. *See* common but differentiated responsibilities principle
- CCA. *See* climate change adaptation, to climate disasters
- CCPR. *See* Council on Climate Preparedness and Resilience
- CCS. *See* Carbon Capture and Storage
- CDM. *See* Clean Development Mechanism
- CDPs. *See* climate displaced persons
- CDR methods. *See* Carbon Dioxide Removal methods
- CERCLA. *See* Comprehensive Environmental Response, Compensation and Liability Act of 1980
- Certified Emission Reductions (CERs), 65
- CH₄. *See* methane
- charity by government, 258
- China, 63
- cities, 226–228. *See also* urban areas
 - adaptation planning for, 231–234
 - DRR and, 226–228
 - Sendai Framework on Disaster Risk Reduction, 187
 - urban adaptation to climate change in Europe, 228–234
- civil liability. *See also* Climate Disaster Response Fund
 - in *AEP*, 328–330
 - causation and, 321
 - compensation for disaster victims through, 320–331
 - doctrine of pre-emption in, 328–330
 - under EPA regulations, 328–330
 - institutional obstacles to, 320–324
 - in Japan, for nuclear disasters, 337–339
 - legal obstacles to, 320–324
 - in *Native Village of Kivalina and City of Kivalina v. ExxonMobil & Others*, 328–330
 - practical obstacles to, 320–324
 - proposed model statute for, 330–331
 - public nuisance and, 328–329
 - strict liability and, 321–322
 - tort law and, 322–323, 328–330
 - tort of civil conspiracy and, 322
- Clean Air Act
 - during Bush administration, 27–28
 - during Obama administration, 28–29
 - Republican Party interference with, 26–30
- Clean Development Mechanism (CDM), in Kyoto Protocol, 64–65
- Climate Action Plan, 277–279
- climate adaptation law, 177–184. *See also* adaptive law

- ATPs in, 178
- socio-ecological resilience approach, 178–179
- climate change. *See also* climate disasters; climate displaced persons; mitigation pathways, for UNFCCC; multi-level governance approaches, to climate change; practical reasoning, climate change and; public reasoning, climate change and; urban areas, climate change in
 - adaptation. *See* adaptation responses, to climate disasters (Climate Change Adaptation (CCA))
 - anthropogenic attribution to, 46–47
 - attack science and, 13
 - biogeochemical cycles, 45
 - carbon cycles, 45
 - cities influenced by, 140
 - commitment to, 45–46
 - in cryosphere, 42
 - differential risks from, 161–162
 - DRR and, 110–120
 - EU response to, 171–172
 - in EU urban areas, 228–231
 - Executive Orders on, in U.S., 172–174, 174, 172–173, 217–218
 - extreme heat as result of, 146–147
 - extreme weather events, 43–44
 - Federal Leadership in Environmental, Energy, and Economic Performance*, 172–173
 - food insecurity as result of, 141–143
 - fossil fuel industry and, 13
 - human impact on, 1
 - human rights and, 123–124
 - human security and, 124–125
 - humanitarian action and, 122–123
 - as irreversible, 45–46
 - legal response to, 4–15
 - multilateral negotiations on, 47–48
 - ocean acidification, 39–40, 151–152
 - ocean warming, 41
 - population aging and, 228–229
 - precipitation change in, 41
 - Preparing the United States for the Impacts of Climate Change*, 174
 - Presidential Policy Directive on Critical Infrastructure Security and Resilience, 217–218
 - public policy and, 4–15
 - research in, public funding for, 356
 - scientific response to, 4–15
 - sea level rise through, 43
 - self-interest and, 99–103
 - social contract theory and, 100–101
 - species and ecosystems, 151–152. *See also specific species*
 - stabilisation of, 45–46
 - sustainable development and, 120–122
 - temperature changes, 40
 - tobacco industry and, 13
 - water scarcity and, 147
 - WG I for, 2
 - WG II for, 2, 36–38
 - WG III for, 2, 36–38
- Climate Change Act 2008, 172
- climate change adaptation (CCA). *See* adaptation responses, to climate disasters (Climate Change Adaptation (CCA))
- Climate Change: Addressing the Major Skeptic Arguments*, 34
- Climate Commission, in
 - Australia, 30–31
- Climate Council, in Australia, 31
- Climate Disaster Response Fund, 333–334
- asbestos and, 341
- CERCLA and, 334
- claimants, 340–341
- compensation and, 332
- CPMs in, 342–343
- damage categories in, 343
- design of, 339–345
- environmental damage and, 344
- fossil fuel-funded and, 331–345
- global oil spills and, 333
- LDCs for, 340–341
- levy formulation for, 341–342
- levy limitations for, 342
- liable entities for, 339–340
- nuclear accidents and, 333, 344
- scope of environmental damages for, 343–344

- Climate Disaster Response Fund (cont.)
 Warsaw International Mechanism
 for Loss and Damage associated
 with Climate Change Impacts and,
 344–345
- climate disasters. *See also* adaptation
 responses, to climate disasters;
 Hurricane Katrina; Hurricane
 Sandy; *specific disasters*
 adaptive capacity to, 137–138
 Capability Approach and, 139
 in cities, 140
 compensation for, 106
 critical infrastructure protections for,
 217–220
 cyclones, hurricanes, and typhoons
 and, 44, 112, 114, 133, 144–146,
 163, 188, 207, 238, 296–297, 305
 damage loss as result of, 132–134
 defined, 132
 DRM for, 184–193
 drought, 143
 DRR for, 134–139
 ecosystems influenced by, 151–152
 extreme heat, 146–147
 floods. *See* floods; Queensland floods;
 Thailand floods
 food insecurity as result of, 141–143
 HDRs for, 134–139
 humans and non-humans, 109–110,
 344, 374
 IPCC assessment of, 132–134
 megafires, 141
 poverty as result of, 143
 recovery, rehabilitation and
 reconstruction after, 106
 relocation and resettlement strategies
 before and after, 225–226
 resilience after, 138–139
 resilience to, 156–158, 374
 response to, 106
 species range influenced by, 151–152
 vulnerability to, 135–137
 water scarcity and, 147
- climate displaced persons (CDPs),
 148–150. *See also* refugees
 from cities, 140
 defined, 148
- displacement events, 148–149
 International Law mechanisms for, 50
 relocation and resettlement strategies
 for, 225–226
 UNHCR strategies for, 226
- climate finance. *See also* Green
 Climate Fund
 fast start and long-term, 76
- Climate Justice
 ability to pay principle for, 129
 beneficiary pays principle in, 130–131
 Capability Approach in, 134–139
 contribution to the problem
 approach for, 126–130
 disaster justice and, 239–240
 distributive approach to, 128–130
 ECP for, 131
 environmental justice and, 238–239
 Hurricane Katrina and, 238–241
 hybrid approach to, 129–130
 lifecycle vulnerability and, 238
 long-term implications of, 238–241
 procedural approach to, 152–154
 theoretical overview of, 125–132
- Climate Research Unit (CRU), 22–23,
 25–26
- climate science
 abuse of, 14–15
 under AR4, 23–25
 under AR5, 36–47
 attack science and, 13
 in Australia, political interference
 with, 30–32
 under Bush administration, 27–28
 climate change and, 4–15
 under conservative governments,
 14–15
 destabilisation of, 15–32
 ExxonMobil and, 18–19
 FOI requests and, 19–21
 IPCC assessment for, 23–25
 law, 21
 in *Native Village of Kivalina and City
 of Kivalina v. ExxonMobil &
 Others*, 18–19
 normative structure of, 6
 under Obama administration,
 28–29

- under OMB, 20–21
 - political interference with, 26–32
 - as ‘post-normal,’ 34–35
 - public policy and, 21
 - scepticism of, 16–19
 - under Shelby Amendment, 19–20
 - in U.S., political interference with, 26–30
- climate science agencies, public funding of, 352–355
- climate scientists, 1
 - Climategate and, 8–9, 22–23
 - on cost-benefit balance, 5
 - credibility challenges for, 16
 - harassment of, 25–26
 - open data for, 355–356
- climate stabilisation, 45–46
- Climategate, 8–9, 22–23
 - CRU during, 22–23
 - impact of in Australia, 30–31
 - investigations during, 22–23
- climate-resilient pathways, 122, 233
- CO₂. *See* carbon dioxide
- coastal megacities, 207–208
- coastal planning principles, 203–204
- Coastal Protection Act (1979), 183
- coastal zones
 - emergency preparedness and response for, 276
 - rebuilding and recovery strategies, 279
- Commission on Human Security, 124
 - Human Security Now and*, 124
- common but differentiated responsibilities (CBDR) principle
 - ability to pay principle, 129
 - in Copenhagen Accords, 69
 - defined, 55–56
 - in Kyoto Protocol, 60, 69
 - and respective capacities at, 92
 - in UNFCCC, 60
- community of inquirers, 7
- Companies Act (2006), 314
- compensation
 - through civil liability, 320–331
 - through Climate Disaster Response Fund, 233
 - for disaster victims, 320–331. *See also* Climate Disaster Response Fund
 - through insurance, 285–302
 - uncompensated economic and non-economic loss, 106
- Compliance Committee, 66
- Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), 334–335
- compulsory insurance, 294
- contribution to the problem approach, for Climate Justice, 126–130
- Convention on the Conservation of Biological Diversity, 54
- COP 3. *See* Third Conference of the Parties
- COP 13. *See* Thirteenth Conference of the Parties
- COP 16. *See* Sixteenth Conference of the Parties
- COP 17. *See* Seventeenth Conference of the Parties
- COP 18. *See* Eighteenth Conference of the Parties
- COP 19. *See* Nineteenth Conference of the Parties
- COP 20. *See* Twentieth Conference of the Parties
- COP 21. *See* Twenty-First Conference of the Parties
- Copenhagen Accord (2009), 68–70
 - CBDR principle in, 69
 - REDD+ in, 67
 - voluntary developed country mitigation commitments under, 71
 - voluntary developing country mitigations under, 71–72
- coping, definition of, 137–138
- corrective approach, to Climate Justice, 126–129
- Council on Climate Preparedness and Resilience (CCPR), 174–175
- CPMs. *See* carbon price mechanisms
- critical infrastructure, 217–220
 - electricity infrastructure and, 218–220
- crop yields, 24
- CRU. *See* Climate Research Unit
- cryosphere, 42

- CSIRO Climate Adaptation Flagship, 31–32
- cyclones, 144–146. *See also* Hurricane Katrina; Hurricane Sandy
- Typhoon Haiyan, 145
- Declaration of the United Nations Conference on the Human Environment*, 52
- Deepwater Horizon disaster, 173
- desertification, 223–225
- developed country mitigation commitments, 71
- developing countries
 - adaptation planning, 233
 - disaster insurance in, 314–319
 - LDCF, 83–84
 - mitigation commitments, 71–72
- development consent policies, 183–184
 - during Queensland floods, 214–215
- deviant science, 9–10
- disaster education, 358–360
- disaster insurance. *See* insurance, for disasters
- disaster law. *See also* climate adaptation law
 - Capability Approach to, 106–110, 134–139
 - Climate Justice approach to, 105–110
 - public reasoning and, 348
 - Sen and, 106–107
- disaster preparedness and response, 243–249
 - plans and, 244–245
- Disaster Relief Appropriations Act 2013, 262
- disaster relief funds, 255–269
 - AGDRP, 264
 - applications for, 267–268
 - auditing of, 268–269
 - in Australia, 264–266
 - under Bellwin Scheme, 263, 265–267
 - budgeting of, 263
 - for businesses, 264–265
 - charity by government, 258
 - under Disaster Relief Appropriations Act 2013, 262
 - distributive justice approach to, 259–261
 - European Union Solidarity Fund, 266
 - ex post and, 257–258
 - exemptions for, 269
 - features of, 261–269
 - implementation of, 268–269
 - inadequacy of, 97
 - individual entitlements for, 264
 - under Multiannual Financial Framework 2014–2020, 263
 - National Disaster Fund, in Thailand, 318
 - NDRRA, 265–266
 - neoliberal approach to, 256–259
 - political self-interest and, 259
 - reporting of, 268–269
 - under Sandy Recovery Improvement Act of 2013, 262, 264
 - under SBA, 273 n160
 - social security and, 264–265
 - under Stafford Act, 261–262, 265–267
 - to state and local governments, 265–267
 - tax rebates for, 269
 - triggers for, 262–263
 - types of, 261–262
- disaster risk management (DRM)
 - for climate disasters, 184–193
 - defined, 194
 - in EU, 185–187, 198–201
 - for floods, 206–217
 - in Vietnam, 187–193
- disaster risk reduction (DRR), 53
 - CCA and, 193–197
 - for cities, 226–228
 - climate change and, 110–120
 - for climate disasters, 134–139
 - for desertification, 223–225
 - for drought, 143, 223–225
 - EC response to, 113–118
 - EIAs in, 242–243
 - electricity technology choices for, 220–221
 - funding of, 118–120
 - through HFA, 110–120
 - law in, 241–243

- in New York State, before Hurricane Sandy, 275–281
- in Philippines, 196–197
- through Sendai Framework on Disaster Risk Reduction, 187
- sustainable development and, 193–197
- UNISDR, 111–112
- disasters. *See* climate disasters; natural disasters
- distributive approach, to Climate Justice, 128–130
 - with disaster relief funds, 259–261
- Doha Amendment, 78
- Doha Climate Gateway (2012), 58–59
- DRM. *See* disaster risk management
- drought, 143
 - DRR for, 143, 223–225
 - Green Infrastructure Strategy for, 163–165, 231
 - grey actions for, 215–217, 231
 - in the Sahel, 142
 - soft solutions for, 209, 231
 - in urban areas, 230–231
- DRR. *See* disaster risk reduction
- Durban Outcomes (2011), 58–59, 70
- EAPs. *See* emergency action plans
- early warning systems (EWS), 190–191, 243, 245–249
 - country examples of, 247–249
 - legal provisions on, 247–249
 - regional cooperation on, 246
- Earth Institute Report, 23
- EC. *See* European Commission
- ecological systems, 9
- economic rationalism, 14–15
- ecosystems
 - climate disasters and, 151–152
 - ecosystem services and, 233
 - RCP scenarios for, 151
- ECP. *See* emergency climate programme
- EEA. *See* European Environment Agency
- EIAs. *See* Environmental Impact Assessments
- Eighteenth Conference of the Parties (COP 18), 78
- EISA. *See* Energy Independence and Security Act
- electricity infrastructure, 218–220
 - DRR and, 220–221
 - after Hurricane Sandy, 220
 - after Queensland floods, 214
- emergency action plans (EAPs), 244–245
 - implementation of, 244
- emergency climate programme (ECP), 131
- emergency preparedness and response, 243–249, 252–255
 - for coastal zones, 276
- EAPs, 244–245
- environmental protection and remediation as part of, 281
- EWS, 190–191, 243, 245–249
- government structure as influence on, 252
- for health care facilities, 272–276
- during Hurricane Katrina, 253–254
- for information infrastructure, 276–277
- multi-jurisdictional frameworks for, 254–255
- in New York State, before Hurricane Sandy, 275–281
- plans and, 243
- risk mapping, 243, 247–249
- for telecommunications infrastructure, 276–277
- for transportation infrastructures, 277
- Union Civil Protection Mechanism, 249–252
- Emergency Response Coordination Centre (ERCC), 250–252
- Emission Reduction Units (ERUs), 82
- emissions trading scheme (ETS), xv, 50–51, 82, 342–343
- Endangerment Finding for Greenhouse Gases*, 34
- energy budget, 36–37
- energy efficiency, 58
- Energy Independence and Security Act (EISA), 28
- ENSO. *See* El Niño-Southern Oscillation
- environmental emergency, 343

- Environmental Impact Assessments (EIAs), 242–243
 environmental justice, 238–239.
See also Climate Justice
 Environmental Protection Agency (EPA)
 civil liability under, 328–330
 Clean Air Act, 26–30
 EISA and, 28
 GHG emissions regulation by, 19, 27–28
 in *Massachusetts v. EPA*, 27
 National Renewable Fuel Standard under, 28
 ERCC. *See* Emergency Response Coordination Centre
 ERUs. *See* Emission Reduction Units
 Ethiopia, 248
 ETS. *See* emissions trading scheme
 EU. *See* European Union
 EU Climate Adaptation Platform, 355
 EU Floods Directive, 212
 EU Civil Protection Mechanism.
 See EU Civil Protection Mechanism, in EU
 EU Water Framework Directive, 213
 European Commission (EC), 113–118
 European Environment Agency (EEA), 168–177
 boundary organisations and, 352
 public reasoning on climate change and, 368–369
 risk assessment for urban areas, 228–231
 in urban areas, 231–234
 European Union (EU). *See also* EU Civil Protection Mechanism
 ATPs and, 178
 climate sector classification in, 172
 DRM in, 185–187, 198–201
 emergency preparedness and response frameworks in, 254–255
 ETS, 82
 Horizon 2020, 356
 Integrated Coastal Zone Management in, 199–200
 marine spatial planning in, 198–201
 natural hazard insurance in, 297–298
 response to climate change adaptation, 171–172
 temperature change in, 229–230
 urban areas in, climate change effects in, 228–231
 EWS. *See* early warning systems
 exposure, definition of, 134–135, 161
 extreme heat, 146–147
 in Australia, 151
 in EU, 229–230
 in Russia, 141
 extreme weather events, 43–44. *See also* China; cyclones; floods; Hurricane Katrina; Hurricane Sandy; Queensland floods; Thailand floods
 ExxonMobil, 18–19
 False Claims Act (Criminal), 29
 FAO. *See* Food and Agriculture Organisation
 Federal Emergency Management Agency (FEMA), 254
 flood insurance and, 305–307
 flood risk mapping and, 308
 Federal False Statements Act, 29
 Federal Interagency Floodplain Management (FIFM) Task Force, 177
 FEMA. *See* Federal Emergency Management Agency
 FIFM Task Force. *See* Federal Interagency Floodplain Management Task Force
 Fifth Assessment Report (AR5), IPCC, 2, 4, 33–47. *See also* mitigation pathways, for UNFCCC
 Bayesian methods in, 35
 biogeochemical cycle changes in, 45
 carbon cycle changes in, 45
 confidence issues in, 34–36
 cryosphere changes in, 42
 extreme weather events in, 43–44
 geoengineering, 39–40
 likelihood scales in, 34–36
 ocean warming in, 41
 precipitation changes in, 41
 RCPs in, 38–39

- sea level rise in, 43
- temperature changes in, 40
- WG I, 2, 36–38
- WG II, 2, 36–38
- WG III, 2, 36–38
- WG reports in, 36–38
- Finance Mechanism, 76
 - fast-start funding, 76
 - long-term finance, 77
- flexibility mechanisms, in Kyoto Protocol, 64–66
- Flood and Water Management Act (2010), 211
- flood insurance, 302–314. *See also*
 - Thailand floods
 - under Biggert-Waters Flood Insurance Reform Act of 2012, 304–307
 - under Companies Act, 314
 - in developing countries, 314–319
 - FEMA and, 305–307
 - Flood Re and, 311–314
 - under Homeowner Flood Insurance Affordability Act of 2014, 306
 - under Insurance Contracts Amendment Act, 310–311
 - NDIR, 307–311
 - NFIP, 304–307
 - in U.K., 311–314. *See also* Flood Re
 - under Water Act, 311–312
- Flood Re, 288, 311–314
- floods, 144–146, 206–217. *See also*
 - Thailand floods
 - assessment of, 303
 - in Australia, 209–215
 - CDPs from, 148–149
 - coastal megacities and, 207–208
 - commercial properties during, 214
 - community infrastructure and, 214
 - damage costs from, 206–207
 - dams and, 215–217
 - development consent practices, 214–215
 - DRM for, 206–217
 - electricity infrastructure protections during, 218–220
 - flood hazard map, 212, 305
 - flood modelling, 213
 - flood overlay map, 213–214
 - Flood Re, 288, 311–314
 - flood risk assessments of, 212
 - flood risk management, 212–213
 - flood state planning policies and controls, 213–214
 - flood studies, 211–212
 - floodplain management strategies, 211–213
 - Floods Directive in EU, 212
 - grey actions for, 215–217
 - hard prevention measures, 215–217
 - infrastructure approaches to, 208–209
 - Internal Drainage Boards, 215
 - local policies, 213
 - overland flow maps, 214
 - Queensland Floods Commission of Inquiry, 214
 - recovery and rebuilding strategies and, 281
 - risk assessment and management for, 212–213
 - soft measures for, 209
 - state planning policies, 213
 - in urban areas, 230
 - Winter floods 2013–2014 report, in U.K., 210
- Floods Directive, in EU, 212
- FOI. *See* Freedom of Information Act
- Food and Agriculture Organisation (FAO), 141–142
- food insecurity, 141–143
 - FAO estimates for, 141–142
- food supplies, in recovery and rebuilding strategies, 281
- foreign aid, 118–120
- fossil fuel industries
 - climate change and, 13
 - climate disaster compensation by, 331–345
- Climate Disaster Response Fund, 333–334
- ExxonMobil, 18–19
- scientific scepticism supported by, 17–19
- Fourth Assessment Report (AR4), IPCC, 23–25

- Freedom of Information (FOI) Act
 climate science under, 19–21
 data access requests under, failure to respond to, 22
 public reasoning under, 376–377
 Shelby Amendment and, 19–20
 freshwater resources, 176–177
 Fukushima disaster. *See* Japan, loss
 compensation for nuclear disasters
The Future We Want, 120
- GCF. *See* Green Climate Fund
 GEF. *See* Global Environment Facility
 gender, lifecycle vulnerability
 and, 241
 geoengineering, 39–40, 46
 GHG emissions. *See* greenhouse gas
 emissions
 glacier retreat, 24. *See also* water
 scarcity
 global emission budget, 95
 Global Environment Facility (GEF),
 83–84
 global justice, 106–107
 Global Platform for Disaster Risk
 Reduction, 144
 global warming, 40
 government insurance, 290–293
 aggregation function with,
 291–292
 risk-financing, 290–291
 segregation function with, 292
 Green Climate Fund (GCF), 76
 World Bank funding for, 76
 Green Infrastructure Strategy
 in CCA, 163–165
 for drought, 231
 greenhouse development rights, for
 Climate Justice, 131
 greenhouse gas (GHG) emissions
 ‘air pollutants’ as, 27–28
 anthropogenic change in, 46–47
 AR4, 23–25
 AR5, 45
 CH₄, 37–38
 under Clean Air Act, 27–28
 CO₂, 37–38, 45, 63
 compulsory insurance for, 294
 under Doha Amendment, 78, 93
 EPA regulation of, 19, 27–28
 under Kyoto Protocol, 63–64
 in mitigation pathway policies, 84–85
 N₂O, 37–38, 45, 85
 WG III prevention of, 2
 greenhouse gas inventories, 72
 Greenland ice sheet, 42
 grey actions
 for droughts, 231
 for floods, 215–217
- HDI. *See* Human Development Index
 HDRs. *See* Human Development
 Reports
 health care facilities
 emergency preparedness and
 response for, 272–276
 recovery and rebuilding strategies
 for, 280
 heat health warning systems (HHWS),
 230
 heatwaves. *See* extreme heat
 HFA. *See* Hyogo Framework for Action
 HFA2. *See* second Hyogo Framework
 for Action; Sendai Framework on
 Disaster Risk Reduction
 HHWS. *See* heat health warning
 systems
 Homeowner Flood Insurance
 Affordability Act of 2014, 306
 Horn of Africa, 143, 224
 Human Development Index (HDI), 160
 Human Development Reports (HDRs),
 121–122
 adaptive capacity assessment in,
 137–138
 for climate disasters, 134–139
 life cycle vulnerability in, 160
 vulnerability assessment in, 135–137
 human rights, climate change and,
 123–124
 human security, climate change and,
 124–125
 humanitarian action, 122–123
 Hurricane Katrina, 177–178
 African Americans and, 240
 Climate Justice and, 238–241

- emergency response strategies
 - during, 253–254
- lifecycle vulnerability and, 238, 240
- in media, 381–382
- in public reasoning debate, 381–382
- transportation vulnerability and, 241
- Hurricane Sandy, 145–146
 - damage costs of, 207
 - DRR preparations before, 275–281
 - electricity infrastructure after, 220
 - Rebuilding Strategy after, 271–273
 - Rebuilding Task Force after, 270–272
- Hyogo Framework for Action (HFA), 359–360
 - DRR through, 110–120
 - EC response to, 113–118
 - LNDPC and, 188–189
- IASC. *See* Inter-Agency Standing Committee
- ice sheet mass, 42
- ICZM. *See* Integration Coastal Zone Management
- IFRCRCs. *See* International Federation of Red Cross and Red Crescent Societies
- impartial practical and public reasoning, Climate Justice and, 346–349
- INDCs. *See* Intended Nationally Determined Contributions
- index-based insurance, 300
- India, 377
- Indigenous peoples, rights for, 375
- Indonesia, 376–377
- information infrastructures, 276–277
- insurance, for disasters. *See also* flood insurance
 - as adaptation responses, 169
 - capital markets for, 301–302
 - Catastrophe Bonds, 301–302
 - Climate Risk Investment Framework and, 364–365
 - compensation for disaster victims through, 285–302
 - compulsory, 294
 - in developing countries, 314–319
 - through governments, 290–293
 - index-based, 300
 - IPCC assessments of, 286
 - MCII, 318–319
 - moral hazard control and, 290, 292–293
 - multi-crop peril, 300
 - parametric, 300
 - penetration of, 288
 - private markets, 293–295
 - in recovery and rebuilding strategies, 280
 - risk aggregation and, 289
 - risk pooling for, in Caribbean, 319
 - risk reduction with, 289–290
 - risk segregation and, 289–290
 - as social institution, 287
 - unconventional products, 300–301
- Insurance Contracts Amendment Act (2012), 310–311
- insurers, catastrophic risks for, 286
- Integration Coastal Zone Management (ICZM), 199–200
- Intended Nationally Determined Contributions (INDCs), 93
- InterAcademy Council, 24
- Inter-Agency Standing Committee (IASC), 123
- intergenerational equity, 56–57
- Intergovernmental Panel on Climate Change (IPCC). *See also* Fifth Assessment Report; Fourth Assessment Report; Human Development Reports; mitigation pathways, for UNFCCC
 - AR4, 23–25
 - carbon budgets, 38, 45–46, 50, 365–366
 - climate disasters assessed by, 132–134
 - climate science assessment by, 23–25
 - confidence issues, 34–36
 - definition of climate disasters, 132
 - DRM and, 194
 - establishment of, 2–4
 - evaluation of adaptation response, 160–169
 - food insecurity assessment by, 141–143
 - functions of, 3
 - geoengineering, 39–40, 46
 - hockey stick graph, 25–26

- Intergovernmental Panel on Climate Change (IPCC). (cont.)
 - nuclear, 90
 - oversight of, 2–3
 - reporting cycle for, 3
 - Representative Concentration Pathways (RCPs) in, 38–39, 151
 - review process for, 3
 - UNEP and, 2
 - UNFCCC and, 3
 - Working Groups in, 2
- international assessment and review, 71
- International Capacity-building Mechanism, 96
- international consultation and analysis, 72
- International Law
 - climate displaced persons under, 50
 - key principles in the UNFCCC, 55–56
- International Oil Pollution Compensation Fund (IOPC Fund), 335
- International Organisation for Migration (IOM), 148
- IPCC. *See* Intergovernmental Panel on Climate Change
- James Hardie Fund, 337
 - levy formulation for, 341
- Japan, loss compensation for nuclear disasters, 337–339
- Joint Implementation Mechanism (JI), 64–65
- justice. *See also* Climate Justice; disaster justice; environmental justice
 - as focus of law, 10
 - global, 106–107
- Kyoto Protocol (1997), 58–59, 62–66, 124–128
 - AAUs, 65–66
 - Australia's ratification of, 127–128
 - Australia's withdrawal from, 77
 - Canada's withdrawal from, 99–100
 - CBDR principle in, 60, 69
 - CDMs in, 64–65
 - CERs under, 65
 - Doha Amendment to, 78
 - ERUs in, 82
 - first commitment period of, 63–65, 67–68
 - flexibility mechanisms in, 64–66
 - future of, 77–78
 - GHG emissions under, 63–64
 - global goals of, 77
 - international emissions trading in, 65
 - Japan's withdrawal from, 77
 - Removal Units (RMUs), 65–66
 - Russian ratification of, 63
 - Russia's withdrawal from, 77
 - second commitment period, 62, 67–68, 77–78, 82, 93
 - U.S. non-ratification of, 63
- land swaps, 164–165
- land use planning, 164–165
 - for bushfires, 221–222
 - for floods, 233–234
 - in urban areas, 233–234
- law. *See also* International Law
 - climate change and, 4–15
 - climate science under, 21
 - distributive consequences of, 11
 - in DRR, 241–243
 - foundations of, 10–11
 - justice *versus* truth under, 10
 - scientific uncertainty and, 9
 - uncertainty under, 11
- Law on Natural Disaster Prevention and Control (LNDPC) (2013), 187–193
 - community participation under, 189–190
 - disaster preparedness under, 193
 - education and training under, 191–192
 - EWS, 190–191
 - HFA and, 188–189
 - implementation resources under, 189
 - prioritisation under, 187–190
 - priority actions in, 187–190
 - research from, 192
 - resilience strategies and, 191–192
 - risk assessment under, 190–193
 - safety culture as result of, 191–192
 - socio-economic development under, 192–193

- Least Developed Countries (LDCs), 72, 74, 84, 93, 96
- Least Developed Countries Fund (LDCF), 83–84
- lifecycle vulnerability, 160, 238
- gender as factor in, 241
- race factors in, 240
- transportation vulnerability, 241
- Likelihood Scale*, 36
- Lima Call to Climate Action (2014), 58–59, 92–99
- adaptation of, 95–96
- capacity-building mechanisms in, 96
- compliance for, 97
- gender and, 241, 371
- implementation of, 97
- INDCs in, 93
- loss and damage in, 96
- mitigation policies for, 95
- objectives of, 93–95
- strategic review of, 97
- time-frames for, 96
- Transparency Framework for, 96
- Lima Ministerial Declaration on Education and Awareness-raising, 359
- Lima Work Program on Gender, 371
- LNDPC. *See* Law on Natural Disaster Prevention and Control
- long-term global goal, 77
- review of, 77
- loss and damage, for climate change impacts. *See* Warsaw International Mechanism for Loss and Damage associated with Climate Change Impacts
- low emission development strategies, 95
- maladaptation, 178, 270
- marine spatial planning, in EU, 198–201
- Massachusetts v. EPA*, 27
- MCII. *See* Munich Climate Insurance Initiative
- media. *See also* new media
- access to information for, 383–384
- Hurricane Sandy in, 381–382
- in impartial practical reasoning debate, on climate change, 377–384
- in procedural approach to Climate Justice, 154
- in public reasoning debate, about climate change, 377–384
- megafires, 141
- merchants of doubt, 378–379
- methane (CH₄), 37–38. *See also* greenhouse gas emissions
- Mexico, 248
- military, role of, 252–253
- Millennium Development Goals, 120–121
- Minorities at Risk Project*, 136
- mitigation pathways, for UNFCCC, 84–92
- in AFOLU, 89
- in building sectors, 88
- cross-sectoral, 87–88
- end-use sectors in, 88
- in energy sector, xv
- GHG emissions and, 84–85
- human settlements and, 89
- in industry sectors, 88–89
- infrastructure and, 89
- long-term, 86
- national policies for, 90–92
- REDD+ and, 89
- renewables and, 90
- sectoral, 87–88
- sectoral policies for, 90–92
- spatial planning and, 89
- sustainable development and, 85–90
- in transport sectors, 88
- monitoring, reporting and verification (MRV), 72
- moral corruption, climate scepticism and, 32–33
- moral hazard, control of, 290, 292–293
- multi-crop peril insurance, 300
- multi-level governance approaches, to climate change, 169–177
- CCPR and, 174–175
- FIFM Task Force, 177
- preparedness strategies, 174–177
- resilience strategies, 174–177
- in U.S., 172–177
- Munich Climate Insurance Initiative (MCII), 318–319

- N₂O. *See* nitrous oxide
- NAMAs. *See* nationally appropriate mitigation actions
- NAPs. *See* National Adaptation Plans
- NASA's Goddard Institute for Space Studies, 17
- National Academy of Science (NAS), 25
- National Adaptation Plans (NAPs), 75–76
- National Climate Assessment, for US, 352–354
- National Disaster Insurance Review (NDIR), 307–311
- National Disaster Recovery Framework (NDRF), 270
- National Environmental Policy Act (NEPA), 28
- National Flood Insurance Program (NFIP), 304–307
 FEMA and, 305–307
 National Flood Mapping Program, 306
 Technical Mapping Advisory Council and, 306
- National Insurance Affordability Council, 310
- National Oceanic and Atmospheric Administration (NOAA), 271, 174
- nationally appropriate mitigation actions (NAMAs), 71–72
- Native Village of Kivalina and City of Kivalina v. ExxonMobil & Others*, 18–19, 328–330
- Natural Disaster Relief and Recovery Arrangements (NDRRA), 265–266
- natural disasters. *See also* Acts of God;
 extreme weather events
 economic damages of, 287
 human-induced, 1
 losses as result of, 24
 unequal geographical distribution of, 287
- natural hazard insurance, 297–298
- natural systems, WG II for, 2
- NDIR. *See* National Disaster Insurance Review
- NDRF. *See* National Disaster Recovery Framework
- NDRRA. *See* Natural Disaster Relief and Recovery Arrangements
- neoliberalism, 256–259
- NEPA. *See* National Environmental Policy Act
- Netherlands Environmental Assessment Agency, 24
- new media, 380–382
 Hurricane Sandy in, 381–382
 impartial public reasoning in, 380–382
 transformation and, 380
- New York State
 Climate Action Plan for, 277–279
 DRR strategies, before Hurricane Sandy, 275–281
 A Stronger, More Resilient New York City, 279–281
- NFIP. *See* National Flood Insurance Program
- Nicaragua, 248
- Niger, 142
- Nineteenth Conference of the Parties (COP 19), 54
- El Niño–Southern Oscillation (ENSO), 37
- nitrous oxide (N₂O), 37–38, 45, 85. *See also* greenhouse gas emissions
- NOAA. *See* National Oceanic and Atmospheric Administration
- nuclear disasters, loss compensation for, 337–339
- nuclear IPCC, 90
- Obama, Barack, 69
 Clean Air Act under, 28–29
 Climate Action Plan, 28–29
 critical infrastructure protections under, 217–220
 Deepwater Horizon disaster under, 173
 Federal Leadership in Environmental, Energy, and Economic Performance, 172–173
 Hurricane Sandy Rebuilding Task Force, 270–272
 multi-agency adaptation governance under, 172–177
 Preparing the United States for the Impacts of Climate Change, 174

- Presidential Policy Directive (PPD)
 on Critical Infrastructure Security
 and Resilience, 217–218
 ocean acidification, as climate change,
 39–40, 151–152
 ocean warming
 AMOC and, 41
 as climate change, 41
 Office of Management and Budget
 (OMB), 20–21
 Office of the High Commissioner for
 Human Rights (OHCHR), 123–124
 OHCHR. *See* Office of the High
 Commissioner for Human Rights
 oil industry. *See* fossil fuel industries
 Oil Pollution Act (OPA), 336
 oil pollution funds, 335–336
 OMB. *See* Office of Management and
 Budget
 OPA. *See* Oil Pollution Act
 OPEC. *See* Organization of Petroleum
 Exporting Countries
 Openness of Public Information Act,
 376–377
 Organization of Petroleum Exporting
 Countries (OPEC), 59–60
Our Common Future, 52–54

 Pakistan, 141, 144–145
 parametric insurance, 300
 PDRRMA. *See* Philippines Disaster
 Risk Reduction and Management
 Act
 per capita emissions, 60
 Philippines
 CCA in, 196–197
 DRR in, 196–197
 PDRRMA in, 196–197
 Philippines Disaster Risk Reduction
 and Management Act (PDRRMA)
 (2010), 196–197
 planned retreat and relocation, 163–165
 Queensland floods and, 165
 polluter pays principle, 56–57
 poverty, from climate disasters, 143
 poverty eradication, 94–95
 practical reasoning, climate change and
 awareness-raising strategies, 358–360
 barriers to, 366
 behaviour change and, 362
 cross cultural issues and, 375
 education and, 358–360
 feminist critique of, 370–373
 Freedom of Information and, 376–377
 in new media, 380–382
 power imbalances, 370–373
 procedural approach to, 356–377
 public participation in, 361
 rights for nature and non-humans,
 373–374
 role of media in, 377–384
 precautionary principle, 11, 56
 precipitation change, 41
 prevention strategies, for climate
 disasters, 156–160
 procedural approach, to Climate
 Justice, 152–154, 234–235
 adaptation response in, 158
 in impartial practical reasoning,
 356–377
 role of media in, 154
 property rights, transformation and, 181
 public participation, 94
 public policy
 abuse of science and, 14–15
 climate change influenced by, 4–15
 climate science and, 21
 economic rationalism as, 14–15
 normative foundations of, 11–15
 societal trade-offs and, 12–14
 public reasoning, climate change and
 access to information in, 376–377
 barriers to, 366
 boundary organisations and, 350–352
 cross-cultural issues in, 375
 disaster law and, 348
 EEA assessment surveys by, 368–369
 engagement strategies for public in,
 362–364
 environmental representation in,
 373–374
 feminist critique of, 370–373
 FOI legislation and, 376–377
 Hurricane Sandy and, 381–382
 impartial and practical, 105–110
 Indigenous people's rights in, 375

- public reasoning, climate change and (cont.)
 - justifications for participation in, 362
 - in new media, 381–382
 - for non-human entities, 373
 - participants in, 364–366
 - power imbalances in, 370–373
 - role of media in, 377–384
- quantified emission limitation or reduction objectives (QELROs), 77
- Queensland floods, 209–215
 - commercial properties during, 214
 - community infrastructure and, 214
 - development consent practices, 214–215
 - floodplain management strategies, 211–213
 - local policies, 213
 - risk assessment and management for, 212–213
 - state planning policies, 213
- race, lifecycle vulnerability and, 240
- radiative budget, 37
- radiative forcing, 37
- RCPs. *See* Representative Concentration Pathways
- reasoning. *See* practical reasoning, climate change and; public reasoning, climate change and
- recovery and rebuilding strategies
 - for building structures, 280
 - Climate Action Plans for, 277–279
 - for coastal zones, 279
 - for flood protection, 281
 - for food supplies, 281
 - for health care facilities, 280
 - Hurricane Sandy Rebuilding Task Force, 270–272
 - insurance in, 280
 - NDRF in, 270
 - in New York State, 275–281
 - SBA and, 273 n160
 - A Stronger, More Resilient New York City*, 279–281
 - for telecommunications, 280
 - for utility infrastructures, 280
- REDD+, 67
- REDD+ safeguards, 73
- Reducing Emissions from Deforestation and Degradation (REDD+), 67, 73
- refugees, 149–150
 - UNHCR and, 226
- relocation and resettlement strategies
 - before and after climate disasters, 225–226
 - UNHCR and, 226
- Removal Units (RMUs), 65–66
- renewables, 90
- Representative Concentration Pathways (RCPs), 38–39
 - for ecosystems, 151
- resilience, definition of, 134, 137–139
- resilience strategies
 - in climate adaptation law, 178–179
 - after climate disasters, 138–139
 - for freshwater resources, 176–177
 - under LNDPC, 191–192
 - in multi-level governance approaches, 174–177
- Right to Information Act, 377
- rigidity traps, resilience and, 158–159
- Rio+ 20, 120
- Rio Declaration, 11, 54, 56–58
- risk aggregation, 289
- risk assessment and management
 - in adaptation responses to climate disasters, 166–168
 - by EEA, for urban areas, 228–231
 - with insurance, 289–290
 - under LNDPC, 190–193
 - for Queensland floods, 212–213
- risk mapping, 243, 247–249
- risk pooling, of disaster insurance, 319
- risk segregation, 289–290
- river basin management plans, 213
- RMUs. *See* Removal Units
- Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), 261–262, 265–267
- Russia, 63, 141
- Sale of Land Act (1962), 222
- Sandy Recovery Improvement Act of 2013, 262, 264

- SBA. *See* Small Business Act
 SBSTA. *See* Subsidiary Body for Scientific and Technological Advice
 SCCF. *See* Special Climate Change Fund
 scepticism, scientific
 conceptual development of, 8
 fossil fuel industries and, 17–19
 moral corruption and, 32–33
 tobacco industry's financial support of, 16–17
 science
 advanced theories in, 7
 as communitarian, 7
 community of inquirers and, 7
 deviant, 9–10
 legal responses to uncertainty in, 9
 normative structure of, 6
 populism and, 6
 scepticism and, 8
 self-correction in, 7
 trust in, 7–9
 uncertainty and, 9
 universal truths and, 7–9
 science community, climate change influenced by, 4–15
 SDGs. *See* Sustainable Development Goals
 sea level rise
 in Australia, 202–206
 through climate change, 43
 coastal planning principles for, 203–204
 environmental planning and assessment for, 202–206
 Hurricane Sandy and, 270
 Small Island Developing States and, 59–60
 storm surges and, 207
 second Hyogo Framework for Action (HFA2), 111–112, 364–365
 security. *See* human security, climate change and
 self-interest, climate change influenced by, 99–103
 Sen, Amartya, 99–103, 106–107, 378
 on Capability Approach, 107–110, 137
 disaster law and, 106–107
 on global justice, 106–107
 on human security, 124
 on procedural approach to Climate Justice, 152–154, 158, 234–235
 Sendai Framework on Disaster Risk Reduction, 187
 Seventeenth Conference of the Parties (COP 17), xvi, 70–72, 78–79
 Shelby Amendment, 19–20
 SIDS. *See* Small Island Developing States
 sinking Small Island Developing States (SIDS), 148–149
 Sixteenth Conference of the Parties (COP 16), 70, 76
 slow onset environmental degradation, CDPs as result of, 148–149
 Small Business Act (SBA), 273 n160
 Small Island Developing States (SIDS), 50, 59–60
 Smart Grids, for resilience, 221
 social contract theory, 100–101, 256
 socio-ecological coevolution, 158
 soft solutions
 for drought, 231
 for floods, 209
 Solar Radiation Management (SRM) methods, 39–40
 Special Climate Change Fund (SCCF), 83–84
Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation (SREX), 132–133, 218
 species and ecosystem impacts, of climate disasters, 151–152
 SRM methods. *See* Solar Radiation Management methods
 Stafford Act. *See* Robert T. Stafford Disaster Relief and Emergency Assistance Act
 Standing Committee on Finance, 76
 State, Local and Tribal Leaders Task Force on Climate Preparedness and Resilience, 174
 Statement of Principles for the Sustainable Management of Forests, 54

- Stockholm Conference on Human Environment, 52
- Stop the Beach Nourishment Inc v. Florida Department of Environmental Protection*, 184
- storm surges, 207
- A Stronger, More Resilient New York City*, 279–281
- Subsidiary Body for Scientific and Technological Advice (SBSTA), 343–344
- Subsidiary Body on Implementation (SBI), 72–73
- Superfund, 334–335
- sustainable development, 53
 - climate change and, 120–122
 - DRR and, 193–197
 - mitigation pathway policies and, 85–90
- Sustainable Development Goals (SDGs), 124
- Syrian Arab Republic, 143
- TASSC. *See* The Advancement of Sound Science Centre
- telecommunication infrastructures
 - emergency preparedness and responses for, 276–277
 - recovery and rebuilding strategies for, 280
- temperature change
 - in Australia, 40
 - climate change through, 40
 - extreme heat, 146–147
 - HHWS and, 230
 - increases in, 85
 - in urban areas, 229–230
 - urban heat stress, 230
- Thailand floods, 315–318
 - compensation for victims of, 318
 - economic impact of, 316–317
 - government revenue after, 316–317
 - industrial impact of, 317
 - infrastructural impact of, 316
 - loss calculations for, 317–318
- Third Conference of the Parties (COP 3), 62–63, 67
- Thirteenth Conference of the Parties (COP 13), 49–50
- tobacco industry
 - attack science and, 13
 - climate change and, 13
 - scientific scepticism supported by, 16–17
 - TASSC and, 18
 - USA v. Philip Morris USA Inc.*, 17
- tort law, civil liability and, 322–323, 328–330
- transcendental institutionalism, 101
- transformational adaptation, 158–160
 - experience with, 163
 - human development approach, 159–160
 - land swaps in, 164–165
- Transparency Framework, 96
- transportation vulnerability, 241
 - emergency preparedness and response and, 277
- Twentieth Conference of the Parties (COP 20), 49–50
- Twenty-First Conference of the Parties (COP 21), 49–50, 349
- Typhoon Haiyan, 145
- U.K. *See* United Kingdom
- UN. *See* United Nations
- UN Habitat, 139
- UN Special Rapporteur on the Human Rights of Internally Displaced Persons, 148–149
- UNCCD. *See* United Nations Convention to Combat Desertification
- uncertainty
 - legal, 11
 - scientific, 9
- UNEP. *See* United Nations Environment Programme
- UNFCCC. *See* United Nations Framework Convention on Climate Change
- UNFCCC Secretariat, 93
- UNHCR. *See* United Nations High Commissioner for Refugees
- Union Civil Protection Mechanism, in EU, 249–252
- ERCC and, 250–252
- preparedness strategies, 250–252
- prevention strategies, 249–250

- UNISDR. *See* United Nations Integrated Strategy for Disaster Reductions
- United Kingdom (U.K.)
 Climate Change Act 2008, 172
 Companies Act in, 314
 Flood and Water Management Act in, 211
 flood insurance in, 311–314
 Flood Re, 288, 311–314
 Water Act in, 311–314
- United Nations (UN)
 Conference on Environment and Development, 54
 HDRs, 121–122
 IASC and, 123
 Stockholm Conference on Human Environment, 52
- United Nations Convention to Combat Desertification (UNCCD), 147, 223–225
- United Nations Environment Programme (UNEP), IPCC and, 2
- United Nations Framework Convention on Climate Change* (UNFCCC), 3.
See also Intergovernmental Panel on Climate Change; Lima Call to Climate Action; mitigation pathways, for UNFCCC
- Agenda 21 and, 54, 56–58
 Bali Action Plan, 67
 Cancun Adaptation Framework and, 74–76
 Cancun Agreements, 58–59, 70–74
 CBD principle in, 60
 Convention on the Conservation of Biological Diversity and, 54
 development of, 52–58
 Doha Amendment, 78
 Durban Outcomes, 58–59, 70
 finance mechanisms, 76
 global goals of, 77
 Green Climate Fund and, 76
 International Law principles for, 55–56
 political groupings under, 59–60
 Rio Declaration and, 11, 54, 56–58
 Statement of Principles for the Sustainable Management of Forests and, 54
- text of, 60–62
- United Nations High Commissioner for Refugees (UNHCR), 226
- United Nations Integrated Strategy for Disaster Reductions (UNISDR), 111–112
- United Nations Integrated Strategy for the Sahel, 143
- United States (U.S.)
 Biggert-Waters Flood Insurance Reform Act of 2012 in, 304–307
 Clean Air Act in, 27–29
 climate science in, political interference with, 26–30
 FEMA in, 254
 multi-agency adaptation governance in, 172–177
 NFIP in, 304–307
 non-ratification of Kyoto Protocol, 63
 universal truths, 7–9
 upstream levies, on feedstocks, 334–336
 urban areas, climate change in, 140
 adaptation planning for, 231–234
 from climate disasters, 140
 in coastal megacities, 207–208
 drought in, 230–231
 EEA for, 231–234
 in EU, 228–231
 flooding in, 230
 heat impacts in, 229–230
 land use planning in, 233–234
 population aging in, 228–229
 risk assessment and vulnerabilities in, 228–231
 socio-economic interactions with, 228–229
 water scarcity in, 230–231
 urban heat stress, 230
- US Global Change Research Program, 352–353
- USA v. Philip Morris USA Inc.*, 17
- utility infrastructures, 280
- Vaughan v. Byron Shire Council*, 181–183
- vegetation clearing strategies, 223
- Vietnam. *See also* Law on Natural Disaster Prevention and Control
- DRM strategies in, 187–193
- EWS in, 247–248

- voluntary commitments, developed and developing countries under
 - Cancun Agreements, 68–69, 71
- vulnerability, definition of, 134–137, 160–161
- Warsaw International Mechanism for Loss and Damage associated with Climate Change Impacts, 79–84
 - adaptation costs, 81–84
- Warsaw Outcome (2013), 58–59
- Water Act (2014), 311–312
- Water Framework Directive, 213
- water scarcity, 147. *See also*
 - desertification; drought
- adaptive management strategies, 147
- UNCCD and, 147
- in urban areas, 230–231
- weather-related disasters. *See* climate disasters; cyclones; extreme weather events; floods; Hurricane Katrina; Hurricane Sandy; Typhoon Haiyan
- WG I. *See* Working Group I
- WG II. *See* Working Group II
- WG III. *See* Working Group III
- Winter floods 2013–2014 report, in U.K., 210
- WMO. *See* World Meteorological Organization
- Working Group I (WG I)
 - in AR5, 36–38
 - climate change assessment, 2
- Working Group II (WG II)
 - in AR5, 36–38
 - natural systems assessment, 2
- Working Group III (WG III)
 - in AR5, 36–38
 - GHG emission prevention, 2
- World Bank, GCF funding by, 76
- World Meteorological Organization (WMO), 53