

Index

A

Abiotic, 7, 14, 61, 63, 124, 252, 256, 347, 353
Adsorbed nutrients, 209
Air pollution, 9, 139, 144, 164, 168, 176–187,
189, 193, 263, 291, 317
Air quality, 9, 11, 132, 160, 163–164,
175–194, 337, 338, 349, 350
Air quality improvement, 186
Air quality regulations, 177, 178
Air temperature, 122, 129, 130, 133, 138, 139,
141, 144, 145, 148, 150, 152–154,
159–161, 166, 167, 169, 176, 178, 179,
183, 185, 186, 189, 193, 194, 240, 242,
261, 274
Ammonia (NH₃), 183, 207, 208, 210
Anoxic, 207
Anthropocene, 265
Association for the Advancement of
Sustainability in Higher Education's
(AASHE), 337
Autotrophic, 204

B

Best management practices (BMP), 326, 335
Big data, 349
Biodiversity, 11, 65–67, 69, 72, 224, 264,
265, 270
Biogenic silica (BSi), 209
Biogeochemistry, 14, 201–215, 221
Biological oxygen demand (BOD), 215
Biophysical, 11, 13, 14, 16, 17, 27–55, 61–63,
76, 101, 105, 112, 240, 242, 244, 246,
252, 260, 261, 308, 348, 352
Biophysical economics, 11, 55

Biotic, 7, 14, 61, 63, 124, 264, 347, 353
Biomes, 251, 252, 260, 264
Boundary layer, 147–153
Brown agenda, 68
Brownfield, 246, 249, 265, 325, 335, 338
Buffer, 73, 325, 326, 352

C

Camouflage, 275
Capitalism, 60, 108, 113, 115
Carbon cycling, 192–193
Carbon monoxide, 176, 177, 182–184, 298
Carbon neutrality, 336
Carbon sequestration, 190, 192, 194
Cell membrane, 209
Charrette, 330–334, 343
Citizen science, 272–273, 283
Climate change, 53, 66, 113, 114, 120,
125–131, 133, 138, 139, 151, 158, 165,
169, 188–194, 242, 259, 265, 315, 335,
348, 349
Collaboration, 74, 76, 302, 322, 324, 327–333,
336, 343, 348, 352
Combined sewer overflow (CSO), 72,
126–128, 130–132, 299, 300
Community-based design, 333–335, 343
Community of concern (COC),
299, 301
Complexity, 14, 60, 86, 101, 316, 323, 324,
331, 353
Composting, 74, 192, 314, 318, 334–336
Concentric zone, 59
Contemporary evolution, 270–283
Contextualist theory, 60

Cradle-to-grave, 228, 232, 341
 Crowd-sourcing, 273, 275, 281

D

Data-logging sondes, 124
 Dead zones, 204
 Decision making, 11, 13, 15, 16, 60, 65, 67,
 71–72, 74, 76, 288, 302, 334
 Decomposer, 207, 215, 221, 232
 Denitrification, 202, 207, 215
 Denitrifier, 207
 Dependency theory, 108
 Design, 10, 62, 98, 103, 125, 139, 186, 213,
 214, 225, 249, 292, 318, 321, 348
 Diatom, 36, 206, 209, 210
 Dioxin, 297, 298
 Dissolved nutrients, 208, 209, 214, 215
 Dissolved oxygen (DO), 124, 127–129, 309
 Diurnal, 124, 127, 150, 163
 Division of labor, 102, 104, 107
 DNA, 209, 271
 Dominant species, 249
 Dongtang, China, 336
 Dry deposition, 208

E

Ecological economics, 11, 240
 Ecological metabolism, 14, 16, 60, 61, 131, 240
 Economic surplus, 101, 102, 108–110
 Ecosystem, 11, 32, 60, 109, 120, 154, 165,
 176, 204, 219, 240, 270, 309, 322, 348
 Ecosystem metabolism, 127, 202
 Ecosystem services, 11, 20, 63, 65, 72, 165,
 240, 260, 322, 338, 340, 341, 353
 Energy, 22, 232–234, 341, 342
 Energy, 3, 28, 60, 86, 101, 120, 138, 176, 201,
 220, 242, 292, 308, 324, 348
 Energy conservation, 69, 184, 336
 Energy diagrams, 220
 Energy flows, 11, 16, 33, 37–39, 61, 141, 220,
 224, 226, 337
 Energy return on investment (EROI), 21, 40,
 44, 50, 113
 Environmental effects, 8–10, 63, 64, 76, 290
 Environmental gradients, 17–18, 255, 256,
 260–264
 Environmental impact, 50, 227, 228, 235, 299,
 317, 324, 325, 327, 337, 341
 Environmental justice, 63, 65, 76, 139,
 288–302, 308, 352
 Epidemiological, 66
 Erosion, 123, 125, 133, 259, 309, 326, 327

Estuary, 29, 32, 45, 124, 204, 206, 213, 216,
 309, 311
 Eutrophication, 124, 204, 207, 216, 309,
 317, 348
 Evapotranspiration, 120, 122, 123, 125, 132,
 133, 143, 145, 168, 260, 261, 340
 Evolution, 39–46, 51, 106, 210–211, 221,
 223–225, 229, 232, 245, 246, 259–260,
 262, 263, 265, 270–283, 348
 Exchange, 15, 46, 89, 96–99, 104, 106,
 140–141, 144, 146, 147, 176, 181,
 228, 328
 Exnora/India, 74–76
 Experimental, 66, 166

F

Federal Home Owners' Loan Corporation
 Association (HOLC), 293
 Fertile Crescent, 4, 41
 Flora, 11, 240–243, 250, 253, 254,
 259–260, 265
 Fluoridation, 210
 Fluorosilicic acid, 210
 Food chain, 37, 40, 41, 206, 207, 209, 210,
 296, 298, 309
 Food desert, 294, 310, 312, 316, 318
 Food-mile, 208
 Foodshed, 201–204, 208, 210–211
 Food systems, 307–318
 Forest, 9, 37, 103, 122, 143, 176, 210, 240,
 272, 308, 342, 350
 Fossil fuels, 16, 21, 33, 37, 39, 41, 43, 45, 47,
 48, 50, 51, 53–55, 86, 98, 104, 105,
 112, 114, 183, 188, 192, 193, 208,
 209, 216, 221, 228, 232, 308, 315,
 336, 341, 342
 Function, 3–5, 7–9, 13, 14, 16, 17, 20, 37, 43,
 45, 54, 55, 63, 67–70, 72, 85, 96, 106,
 108–110, 112, 120, 133, 165, 177, 193,
 220, 222, 226, 236, 242, 251–260, 264,
 265, 271, 294, 302, 322, 324, 328, 338,
 340, 347

G

Genetic variation, 283
 Genotypes, 281, 283
 Geographical cline, 281, 282
 Governance approach, 60
 Gradient, 33
 Gradients, 18, 67, 68, 123, 141, 155, 242, 251,
 256, 260–264, 270, 272, 281, 283, 313
 Gray infrastructure, 301, 341, 350, 352

Gray squirrel, 271–283
 Green Agenda, 68
 Greenhouse gas (GHG), 69, 114, 138, 166,
 175–194, 207, 309, 310, 317
 Green infrastructure (GI), 4, 16, 21, 61, 63, 72,
 131–132, 260, 265, 300, 301, 324, 326,
 335, 341
 Gross Domestic Product (GDP), 49, 113

H

Haber-Bosch process, 207, 208, 309
 Habitat, 4, 5, 7, 8, 13, 15, 37, 66, 68, 70, 125,
 240, 242–246, 250–253, 260, 261,
 264, 265, 270, 281, 308, 324, 335,
 336, 339
 Health, 9, 43, 63–67, 76, 89, 94, 109,
 113–115, 120, 130, 131, 139, 161,
 168, 175–177, 179, 182, 183, 187,
 190, 194, 204, 210, 229, 240, 242,
 254, 270, 288–290, 292–299, 308,
 310, 313, 316, 317, 322–324, 337,
 341, 348, 349, 352
 Heat island, 132, 138, 139, 150, 152, 163,
 164, 166–168, 178, 185, 193, 282, 324,
 335, 338
 Heavy metals, 133, 313, 352
 Heterotrophic, 204
 Historical theory, 59
 Homocene, 265
 Human economy, 341, 342
 Human ecosystem, 63, 64, 67, 76
 Human-induced rapid evolutionary change
 (HIREC), 259
 Hunters, 5, 37, 40, 43, 45, 46, 240, 272, 273,
 275, 281
 Hunting, 40, 49, 270, 272, 275, 281–283
 Hydrocarbons, 39, 47, 49, 50, 113, 114,
 297, 298
 Hydrology, 11, 13, 14, 120–133, 160, 203,
 206, 213–214, 245, 256, 348
 Hypoxic, 204

I

Impervious surface, 19, 126, 127, 131, 154,
 202, 203, 206, 213, 214, 311, 313
 Industrial ecology, 225–229, 232, 235
 Industrialization, 8, 17, 48, 49, 103,
 144, 211
 Infiltration, 120, 122–125, 131, 132, 179,
 336, 340
 Infiltration capacity, 124, 131
 Invasive, 259

L

Labor process, 104, 105, 107, 108
 Land cover, 16, 19, 122, 123, 150, 155, 159,
 160, 165, 169, 210, 212, 251, 273,
 274, 278
 Landscape, 14, 17, 28, 31, 32, 54, 60, 61, 65,
 68, 71, 74, 131, 132, 138, 139, 143,
 145, 164, 179, 190, 202, 207, 211, 213,
 240, 242, 247–249, 252, 253, 255, 259,
 265, 271, 273, 277, 278, 282, 283, 321,
 322, 324, 325, 328, 335
 Landscape architecture, 328, 330, 331, 338
 Land use, 10, 14, 16, 19, 20, 60–62, 64, 67,
 68, 70, 71, 76, 122, 123, 145–147, 151,
 155, 156, 159, 160, 188, 203, 212, 213,
 253, 260, 264, 270, 272, 273, 278, 281,
 283, 291, 308–310, 312, 348
 Lead, 10–13, 291, 293, 294
 Leadership in Energy and Environmental
 Design (LEED), 337, 338, 340, 342
 Life cycle analysis (LCA), 227, 317
 Livability, 63, 65, 76
 Local Agenda 21, 69, 70

M

Mammals, 44, 240, 247, 249, 270, 281
 Masdar City, 336
 Mass balance, 214, 226
 Material flows, 20, 219–222, 225, 233, 235
 Melanism, 274, 277
 Mercury, 7, 263, 297, 298
 Mesopotamia, 5, 41, 97
 Metabolism, 3, 4, 8, 10, 12, 14–16, 20, 22,
 33, 34, 37, 46, 55, 60, 61, 76, 85–99,
 122, 124, 127–128, 131, 144,
 201–204, 219, 221, 223, 224, 226,
 240, 243, 293, 298, 348
 Micrometeorology, 206
 Millennium Ecosystem Assessment, 65
 Mortality, 168, 194, 254, 270, 272, 277, 296
 Multidisciplinary, 14, 308, 328, 329, 339

N

Native species, 249, 250, 252, 253, 259, 264,
 265, 308
 Natural analog, 245
 Natural cities, 34
 Natural selection, 45, 223, 224, 244, 245, 251,
 261, 262, 273, 283
 Naturalized, 246, 250, 263, 264
 Net Anthropogenic Nitrogen Input
 (NANI), 202

- Net Anthropogenic Phosphorus Input (NAPI), 202
- Nitrate (NO₃), 207–210, 215, 298
- Nitrite (NO₂), 207, 210, 215
- Nitrogen, 20, 34, 124, 176, 177, 183, 194, 202, 204, 206, 207, 209, 211–214, 216, 219–221, 244, 255, 308, 309, 314
- Nitrogen dioxide (NO₂), 176, 177, 182
- Nitrogen fixation, 207
- Nitrogen Oxide (NOx), 176, 177, 182–184, 208, 209, 297, 298
- Nitrous Oxide (N₂O), 188
- Novel ecosystems, 243, 264, 348
- Nutrient cycling, 13, 154, 204, 206, 255, 309
- Nutrient retention, 202
- O**
- Oberlin Project, 336
- Optimum ecological space, 17
- Ozone, 7, 160, 167, 168, 176, 177, 179, 182, 183, 185–187, 263, 291, 297
- P**
- Parks, 5, 11, 45, 72–74, 76, 139, 146, 156, 157, 159, 160, 165, 166, 177, 178, 202, 209, 240, 242, 252, 253, 255, 261, 265, 270, 275, 292, 293, 300, 301, 331
- Participatory research, 272, 281
- Particulate matter, 176, 181–184, 187, 291
- Particulates, 16
- Petroleum/oil, 50, 52–53, 126, 133, 177
- Phospholipid, 209
- Phosphorus, 201, 206, 207, 209, 212, 215, 216, 219–221, 309, 314
- Photosynthesis, 33, 34, 36, 37, 61, 86, 125, 177, 219, 220, 224
- Phytoliths, 209
- Placemaking, 333, 334
- Platinum rating, 338
- Pollution, 4, 9, 18, 69, 105, 109, 123, 126, 132, 145, 164, 176–182, 185–187, 189, 193, 194, 211, 213, 223, 229, 230, 263, 291, 292, 301, 308, 310, 311, 313, 317, 327, 348
- Pollution removal, 179–181, 185–187, 194
- Population, 4, 5, 8–10, 13, 32–34, 37, 39, 43, 44, 47, 49, 54, 55, 60, 61, 66, 68, 86–91, 94, 102, 104, 108, 110, 112, 113, 157–159, 167, 177, 181, 186, 192, 204, 207, 210, 211, 214, 215, 222, 242, 254, 270–272, 281, 282, 289, 290, 308–311, 313, 315, 335, 336, 350, 353
- Precipitation, 13, 86, 120–123, 126, 128, 129, 131, 133, 139, 145, 157, 164, 165, 168, 179, 188, 193, 349, 350
- Primary treatment, 214
- Production, 16, 20–22, 31–39, 45, 47, 50, 53, 55, 61, 87, 102–109, 115, 124, 131, 133, 141, 168, 193, 202, 208, 210, 211, 213, 216, 219–224, 226, 227, 229–234, 236, 257, 309–313, 315–318, 329, 330, 336, 337, 348
- Q**
- Quality of life, 11, 13, 45, 63, 65, 68, 72, 76, 292–294
- R**
- Radiolarians, 209
- Rain gardens, 72, 131, 132, 249, 265, 337, 340, 341
- Reactive nitrogen (Nr), 208, 309
- Recycling, 35, 45, 76, 109, 222, 224, 227, 229, 231–233, 235, 291, 317, 334, 336
- Reductionist theory, 60, 76
- Renewable energy, 336, 342
- Resilience, 11, 12, 240, 259, 315–316, 349, 352
- Resiliency, 68, 314, 315, 317, 318, 352
- Respiration, 16, 33, 36, 39, 45, 55, 124, 154, 207, 220, 226
- Risk perception, 296, 297
- Rochester, 335
- Runoff, 4, 19, 72, 121–127, 131, 132, 154, 202, 203, 206, 213, 214, 216, 240, 327, 336, 340
- Rural to urban gradient, 17, 18
- S**
- Safe-to-fail, 350
- Saturated hydraulic conductivity, 123, 131
- Sciurus carolinensis*, 270–283
- Seattle, 8, 53, 68, 245, 336
- Secondary treatment, 215
- Silicate (SiO₂), 209
- Silicon (Si), 206, 209–210
- Site design, 321, 323–325, 327
- Site inventory, 326
- Slums, 8, 9, 75, 108, 109, 112
- Social benefits, 67, 76, 317
- Social-ecological metabolism, 14, 16, 61, 348
- Social-ecological systems (SES), 60, 63, 76, 316, 348, 352

- Social-Ecological Technical/Technological Systems (SETS), 352
- Social sciences, 11, 13, 59–68, 71–72, 76
- Sodium fluorosilicate, 210
- Soil contamination, 317
- Soil horizons, 243
- Solar PV, 337
- Solid waste, 74, 76, 207, 214, 222, 229, 230, 232, 233, 314, 315, 348
- Squirrels, 4, 7, 271, 274, 276, 278–280
- Stakeholders, 60, 69, 71, 76, 290, 291, 295, 325, 329, 330, 333–335, 338, 340, 343, 349, 352
- Stockholm Royal National Urban Park, 72–74, 76
- Stormwater, 4, 22, 125, 126, 131, 132, 214, 265, 324, 325, 327, 328, 335, 336, 338–340
- Stream metabolism, 124, 127–128
- Structure, 3–5, 7–9, 13, 14, 17, 18, 33, 38, 39, 43, 60, 67, 72–74, 76, 103, 104, 106, 108, 112, 113, 115, 122, 123, 125, 131, 138, 139, 145, 147, 148, 152, 159, 161, 183, 184, 193, 194, 206, 209, 210, 233, 243, 246, 251, 252, 263, 270, 294, 325, 327, 328, 334, 340, 347
- Succession, 243, 249–251, 254–257
- Sulfur dioxide (SO₂), 176, 177, 182–184, 187, 298
- Survey-based, 66
- Sustainability, 10, 11, 16, 17, 20, 59–77, 109, 133, 227, 232, 240, 259, 260, 314, 316–318, 321–343, 349, 352
- Sustainability metrics, 337–343
- Sustainability tracking, assessment and rating system (STARS), 337
- Sustainable cities, 68–71, 76, 101, 115, 353
- Sustainable sites initiative (SSI), 337–340, 342
- Sweden, 44, 336
- Syracuse, 22, 30, 31, 37, 72, 127, 187, 253, 257, 273, 275, 277–279, 281, 282, 296, 300, 328, 338, 339
- Systems approach, 46, 76, 316–318, 323, 341
- Systems ecology, 3, 13–16, 224
- Total nitrogen, 215, 216
- Transformation, 20, 22
- Transportation, 16, 22, 29, 31, 32, 49, 50, 55, 103, 105–107, 113–115, 125, 178, 188, 202, 204, 211, 214, 230, 291–293, 307, 309, 313, 317, 328, 330, 349
- Tree canopy, 161, 165
- Tree cover, 139, 146, 155, 161, 165, 179–187, 189, 190, 194, 282, 323
- Trophic, 34, 37, 39, 46, 270
- U**
- United States Environmental Protection Agency (US EPA), 65, 301
- Ur, 4, 5, 41, 42, 161
- Urban, 3, 37, 59, 85, 101, 120, 138, 176, 201, 222, 239, 270, 321, 347
- Urban boundary layers (UBL), 147, 148, 152–154
- Urban canyon, 206
- Urban ecology, 3–23, 28–55, 60, 101, 241, 251, 272, 308, 321
- Urban ecosystems, 7, 8, 12–14, 20, 59–77, 204, 214, 256, 270, 336, 338, 341, 342, 353
- Urban forests, 18, 21, 37, 151, 154, 176, 183, 184, 190, 192–194, 275, 277, 278, 282, 350
- Urban heat island (UHI), 13, 138, 139, 146, 147, 152–161, 163–169, 178, 185, 193, 324
- Urbanism, 60, 99
- Urbanization, 10, 11, 17, 20, 59, 61, 108, 112, 120, 125–131, 133, 138, 139, 145, 157, 185, 243, 251, 252, 260, 270–283, 348
- Urbanoneutral, 263
- Urbanophile, 263
- Urbanophobic, 263
- Urban Resilience to Extremes Sustainability Research Network (UREx-SRN), 352
- Urban-rural gradients, 155, 272, 281, 283
- Urban water cycle, 120, 213
- US National Pollutant Discharge Elimination System (NPDES), 335
- T**
- Temperature, 17, 31, 206, 208, 240, 274
- Tertiary treatment, 207, 215
- Third world cities, 104, 107–110
- Total dissolved solids (TDS), 215
- Total Kjeldahl Nitrogen, 216
- V**
- Vernal pools, 326
- Visioning, 352
- VOC emissions, 183
- Volatile organic compounds (VOC), 133, 177, 178, 182, 184, 185

W

Wastes, 9, 14, 20, 34, 61, 68, 74–76, 202, 206,
207, 209, 211, 213–216, 288–292, 297,
299, 300, 327, 348
Waste sites, 255, 256, 292, 297
Wastewater, 124, 125, 215, 226, 233, 292,
299–301, 341

Wet deposition, 208

Wetlands, 10, 130, 133, 207, 243, 325, 326,
328, 335, 350

Wildlife, 9, 214, 240, 249, 253, 255, 270–283,
336, 340