

Index

- active sensors, 36, 288
 - opportunities for greater use, 309
- adaptive management framework, 8, 9, 101
 - chimpanzees, 99
- aerial photography, 27, 276, 277
- Aichi targets, 6, 11, 164, 305
 - cost of, 7
- airborne sensors, 18
- analysis ready data (ARD), 305
- anthropogenic lights, 35
- ARSET, 290, 309
- atmospheric window, 31
- AVISO, 258

- backscatter, 37, *see* radar
- benefits of integrating remote sensing into
 - conservation, 303
- big data handling, 251
- biodiversity
 - definition, 1
 - extinction crisis, 1, 301
- Biodiversity and Protected Areas
 - Management programme, 139
- biologically realistic predictions, 254
- bits (grey-scale), 44, 45
- blue whale
 - Argos satellite tracking, 233
 - conservation status, 231
 - distribution, 233
 - distribution mapping, 234
 - ecology, 235
 - estimating kernel home ranges, 236
 - populations, 231
 - shipping lanes, 237, 238
 - telemetry, 233, 234, 251
- burned area. *see* fire

- canopy structure measurement, 288
- capacity, 275, 287
 - development, 85, 156, 157, 221, 289, 290, 309
 - early image processing, 10
 - lack of in the conservation
 - community, 14
 - lack of processing power, 16
 - limited use of remote sensing data, 277
 - retention of trained individuals in
 - conservation, 291
- Central Africa Regional Program for the
 - Environment, 84
- centralised database structure, 217
- change in attitude to remote sensing data, 275
- chimpanzee
 - community conservation strategies, 99
 - distribution, 88
 - future land-use, 100
 - habitat association, 94, 95, 97, 105
 - habitat loss, 87, 90, 92, 93
 - monitoring, 86
 - multi-scale planning, 101
 - ongoing monitoring from remote
 - sensing, 97
- chimpanzee conservation
 - lessons learnt, 106
- chlorophyll, 283
- chlorophyll-*a*, 236, 239, 243
- climate change, 54, 71, 84, 260, 281
 - effects on ecosystem function, 187
 - effects on protected areas, 165
 - increased rate, 5
 - potential drought, 169
 - predicted drought, 181
 - threat to biodiversity, 3
- cloud computing, 16, 72, 83, 100, 108, 276, 283, 293
- CMEMS, 241, 258
- collaboration
 - benefits to conservation, 67
 - conservation and remote sensing
 - communities, 19, 58, 100, 293
 - decision support tool design, 107, 156, 186
 - design of MODIS sensor, 283
 - multi-organisation, 156

- need for, 303–304
- scientist and conservation
 - communities, 315
- scientists and conservationists, 138
- scientists and local resource managers,
 - 96, 107, 144, 147, 166, 216
- user buy-in, 248
- workshops to disseminate results, 218
- Committee on Earth Observation Satellites,
 - 28, 29, 46, 50, 52, 305
- communication of results, 67
- confidence intervals, 262
- conservation biology, 5
 - definition, 7
- conservation budgets, 7, 286
- conservation impact, 65, 66, 68, 100, 106,
 - 119, 149, 176, 182, 198, 215, 233, 244, 285, 289
- problems measuring, 73
- Conservation International, 10, 22, 274
 - aerial survey programme, 279
- conservation organisations
 - foundation of, 5
- conservation remote sensing, 11, 48
 - conservation needs, 13, 19
 - increase in publications, 11
- conservation science, 5
- conservationist–space agency
 - interaction, 304
- Convention on Biological Diversity, 1, 164,
 - 165, 188, 305
- Convention on International Trade in Endangered Species, 6
- Convention on Migratory Species, 70
- Copernicus, 15, 283, 287
 - Marine and Environment Monitoring Service, 243
- Coral Reef Watch, 302
- correlations between MODIS covariates on mule deer survival, 210
- COST, 47
- Critical Ecosystem Partnership Fund,
 - 280, 281
- cross-calibration of sensors, 50
- current and future planned Earth-observation missions, 29
- data accessibility
 - cost, 289
- data consistency, 253
- data continuity, 253, 258, 283
- data distribution
 - internet access, 159
- data processing levels and products, 46–48,
 - 287, 305
- data processing power, 289
- data portals, 125
- decision support tools, 87, 100, 104, 120, 139,
 - 140, 159, 166, 176, 198, 214, 217, 221, 244, 245, 251, 310
 - longevity, 257
- democratisation of data and tools for monitoring, 294
- digital numbers, 47
- DigitalGlobe, 104
- Doñana National Park, 166, 167
 - appropriate remote sensing data, 170
 - area, 167
 - climate, 167
 - habitats, 167
 - land-use, 168
 - pressures and threats, 168
 - wildlife, 167
- drones, 18, 27
- Durrell Wildlife Conservation Fund, 285
- early use of remote sensing data in conservation, 277
- East Asian–Australasian Flyway, 57, 68
- East Asian–Australasian Flyway Partnership, 66
- ecological resilience, 165, 172, 179
- ecosystem services, 54, 280
- eddy kinetic energy, 239
- Ekman upwelling, 239
- El Niño, 261, 282
- electromagnetic spectrum, 27, 30, 31, 32, 37,
 - 121, 206
- empowerment of local communities to use remote sensing data, 294
- end-user engagement, 303, 315
- Enhanced Vegetation Index (EVI), 170,
 - 172, 144
- ERDDAP data server, 243, 253
- ESA, 304
- eStation, 49, 120, 138, 139
- evapotranspiration, 170, 183
 - effects of clear-cutting trees, 183
- evapotranspiration rates, 169

320 INDEX

- extinction
 - indicator species, 4
 - rates, 2
- extreme drought events, 166
- fire, 49
 - active, 121, 125
 - burned area, 119, 121, 122, 125
 - burned-area detection
 - variation between vegetation types, 123
 - contribution to climate change, 119
 - dedicated sensors, 124
 - detection, 119, 121, 124
 - ecological role, 132, 137, 149
 - effects on ecosystems, 133
 - estimate of accuracy of burned-area mapping, 131
 - fronts, 121
 - history of monitoring from remote sensing, 124
 - lessons learnt in monitoring, 156
 - management fires in West Africa, 150
 - management plans, 149
 - modification of natural regime, 133
 - monitoring products, 125
 - objectives of monitoring tool data use, 151
 - protected-area management, 119
 - regime, 133
 - role in ecology, 120
 - severity, 133
 - type, 133
 - use as a tool by humans, 136
- fire-activity variables, 120
- Fire Alert System, 285
- fire causes, 119
- fire detection
 - omission and commission errors, 122
- Fire Monitoring Tool, 120, 139
 - example, 154
- fire radiative power, 122
- FIRMS, 49, 125, 141, 284
- forest-cover monitoring, 280
- forest loss, 82, 86, 285
- forest-loss alerts, 110
- FORMA, 285
- fractional snow cover, 209
- functional analysis, 208
- future remote sensing missions of interest to conservation, 295, 313
- GEDI, 38
- generalised additive mixed model, 243
- geographical bias in case studies, 302
- geometric correction, 48
- Global Conservation Fund, 280
- global forest change, 49, 84, 86, 87
- Global Forest Watch, 49, 85, 110, 275, 285
- Global Land Cover Facility, 286
- Global Surface Water Explorer, 49
- Global Tiger Initiative, 86
- Google Earth Engine, 84, 86, 276, 288, 290
- Great Apes Survival Partnership, 101
- habitat loss, 99, 194, 280, 306
 - number of species threatened, 3
- history and milestones of remote sensing, 26–30
- holistic ecosystem monitoring and forecasting, 292
- hunting
 - real-time population prediction for harvest setting, 197
- hyperspectral image data, 40
- Idaho Department of Fish and Game, 198, 216
- identification of areas with a heightened response to drought, 181
- IKONOS, 106
- image bandwidth, 40
- image classification, 277
- image ortho-rectification, 47
- importance of technology advancement, 314
- important bird and biodiversity areas, 86
- in situ* data, 110, 203, 204, 218, 254, 277
- Integrated Ocean Observing System Animal Telemetry Network, 252
- integrated population model, 197, 204, 211
- integrating *in situ* and Earth observations, 17, 311–312
- Intergovernmental Panel on Climate Change, 293
- Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, 305
- International Union for the Conservation of Nature (IUCN), 6, 56
- intertidal zone, 58, 59

- IUCN Red List Index, 2
- IUCN Red List of Ecosystems, 3, 71
- IUCN Red List of Species, 2, 69, 86, 87, 264, 280
 - categories, 2
 - informed by remote sensing data, 16
- Jane Goodall Institute, 99
- key satellite products and tools for biodiversity conservation management, 48–49
- keystone species, 4
- krill, 235, 239
- Landsat
 - forest loss, 16, 281
 - global forest change, 16
 - history, 9, 28, 29, 83, 276
 - in chimpanzee species distribution model, 97
 - in peer-reviewed biodiversity research, 11
 - mapping loss of tidal flats, 60–63
 - monitoring chimpanzee habitat loss, 90
 - spatial resolution, 15, 41, 61, 83
 - temporal resolution, 45, 61
 - use by case studies, 306
 - utility for land-cover mapping, 277
- Landsat Archive, 15, 28, 62, 72, 74, 83, 105, 290
- lessons learnt
 - Doñana National Park, 186
 - mule deer, 215
 - WhaleWatch, 246
- lidar, 37, 289, 304
- limited budgets, 289
- Living Planet Index, 2
- mark–recapture models, 254
- mean–variance plots, 176, 178
- metadata, 47, 61, 217
- methods to map the waterline, 59
- migratory shorebird declines, 56
- MODIS
 - blue whale distribution, 258
 - fire products, 141
 - land surface temperature, 171
 - monitoring Doñana National Park, 172
 - monitoring fires on protected areas, 141–143
 - mule deer population models, 206–211
 - mule deer population size, 212
 - spatial resolution, 41
 - use by case studies, 306
 - vegetation index, 171
- monitoring of ecosystem dynamics, 208, 282
- Montana Cooperative Wildlife Research Unit, 219
- mule deer, 198
 - annual life-history and management cycle, 201
 - body mass, 210
 - ecology, 200
 - hunting, 202
 - life-history, 201
 - management units, 198, 206, 209, 212, 218
 - overwinter fawn survival, 197, 209
 - population management, 197
 - populations, 200, 203, 212
 - setting harvests, 202, 214
 - study area, 199
 - survival model, 210
- multispectral image data, 40
- nanosatellites, 295
- NASA’s Earth Exchange, 276
- near real-time
 - data, 246
 - monitoring, 284
 - prediction, 253
- need for intuitive monitoring metrics, 186
- Normalised Difference Vegetation Index (NDVI), 33, 46, 49, 145, 206, 208, 282, 285
- normalised difference water index, 61
- observatory of ecosystem function, 166
- observing the Earth, 8–18
- Ocean Biogeographic Information System (OBIS)–SEAMAP, 252
- open-source software, 108, 288, 290
 - Google Earth, 288
 - GRASS, 288
 - Python, 62
 - Q-GIS, 16, 288
 - R, 16, 63, 171, 208, 288
- Open Standards for the Practice of Conservation, 101

322 INDEX

- orbits, 44
 - equatorial, 35
 - geostationary, 34
 - polar, 34
- Pacific Decadal Oscillation, 253
- passive or active sensors, 36
- passive sensors, 35
 - advantage of long time series, 308
 - community familiarity, 308
 - popularity in case studies, 307
- pixels, 38
- PopR, 214, 221, 222
- protected-area management
 - assessing management effectiveness, 164
- protected areas, 15, 18, 87, 107, 147, 164
 - coastal, 68
 - Doñana National Park, 166
 - drawing boundaries, 279
 - effectiveness, 185
 - fire management, 137, 139, 144
 - data needs, 164
 - fires, 119
 - Park W, 147
 - use of remote sensing data, 165
- radar, 37, 132, 288
- radiance, 47
- radiometric and atmospheric correction, 47
- Ramsar Convention on Wetlands, 6
- Random Forests regression, 96
- random walk model, 238
- REDD, 20, 85, 281, 286, 291, 297, 298
 - reporting, 281
- reflectance, 47
- remote sensing
 - conservation challenges, 289
 - first use of term, 27
 - in ecology and conservation, 15
 - to inform conservation priority setting, 279
- resilience of xerophytic shrubland, 182
- resistance/elasticity plot, 176, 180
- resolution
 - radiometric, 44
 - spatial, 38, 39, 41, 97, 104, 170, 249, 284
 - spatial in fire detection, 123, 131, 143
 - spatial scale mismatch, 314
 - spectral, 40, 121, 170
 - temporal, 44, 110, 120, 170, 249, 284
 - temporal in burned-area detection, 131
 - temporal in deer management, 197
 - temporal in fire detection, 122, 123, 125, 143
 - temporal resolution benefits, 306
 - temporal vs. spatial, 305
- resolutions and their trade-offs, 38–46
- satellite and sensor characteristics, 34
- satellite images
 - cost of, 9
 - data distribution, 138
 - data portals, 49, 53
 - free data, 15, 40, 72, 83, 108, 140, 171, 244, 253, 287, 290
 - processing, 9
- satellite sensor calibration, 50
- science policy interface, 176, 198, 215, 282
- science to applications, 166, 248
- sea surface height, 258
 - anomaly, 239, 243
- sea surface temperature, 235, 239, 243, 247, 283
- sea-level rise, 54
- Selous Game Reserve, 144, 146
 - fire in management, 145
- Sentinel-2
 - temporal resolution, 46
- SilvaCarbon, 291
- snow cover, 49, 206, 208
- spatial resolution of management, 106
- species distribution model, 18, 94, 109, 232, 239, 243
 - accuracy, 261
 - temporal consistency, 261
 - uncertainty in the predictions, 250
 - validity, 254
- spectral signature, 32, 43
- stability metrics, 176
- state-space model, 236
- sustainability and life span of remote sensing systems, 50–51
- sustainable development goal, 293
- swath width, 40
- SWFSC, 249, 254
- technical barriers to use of satellite images, 287

- technical capacity, 289
- technology constraints, 159
- thermal anomaly, 121
- thermal infrared sensor, 35
- threatened species
 - population recovery, 196
- tidal flats, 54–56
 - loss, 54, 59, 63, 68, 72, 73, 74, 306
 - mapping, 58, 63
 - migrant shorebirds, 65
 - threats, 54
- tide heights, 59
- time lag for data uptake, 313
- TurtleWatch, 235, 247
- TVDI, 170
- umbrella species, 87
- ungulates, 197
 - hunting, 194
 - key species in ecosystems, 194
 - population management, 195
 - scientific basis for harvest size, 195
 - setting harvest quotas, 196
- use of remote sensing data to explain
 - ecological dynamics, 206
- uses of near-real-time information of fire
 - occurrence, 143
- validation, 256
- vegetation dynamics, 169
- VIIRS
 - blue whale distribution, 258
- visualisation tools, 310
- Wealth Accounting and the Valuation of
 - Ecosystem Services, 280
- whales
 - causes of mortality, 229
 - field monitoring, 234
 - protection in USA, 232
 - ship-strike mortality, 230
- WhaleWatch
 - continuity, 252
 - goal, 235
- wind speed, 239
- World Fire Atlas, 124
- Yellow Sea, 56, 57, 63