

Index

- abstract, 13–14, *See also* Chapter 14.
- AEKOS – TERN Ecoinformatics, 76
- Agra, India, 71, 81
- agriculture, 67
- Aichi Targets*, 53
- ambiguity, 217
- amplitude, 36, 114, 117–118, 128
- annual cycle, viii, 18, 41, 56, 89, 95, 106–108, 112–114, 123, 126, 145, 157
- anomaly dataset, 112, 148
- anthropogenic, 127
- antiphase, 157
- Australian Antarctic Data Centre, 76
- average, 94, 97, 108, 134, 142, 152
- averaging window, 111

- bar graphs, 25, 31, 33, 72
- bell curve, 149
- bias, scientific, 17
- bibliography, 210–211
- BioMed*, 75
- box plots, 23, 33
- budget, 223

- categories, binary, 82
- central tendency, 139
- citations, 208–209
- climate change, 67, 193
 - natural variability, 86, 106
- CO₂ emissions, 89, 106
- composite dataset, 108
- Comprehensive Nuclear Test Ban Treaty, 52
- conclusions, 19, 216
- control, scientific, 80
- convergence, 44
- COP21. *See* United Nations Climate Change Conference of the Parties
- coral bleaching, 80–81
- coral reef, 70, 80
- correlation, 94, 155, 157
 - anti-phase (negative), 159
 - in phase (positive), 159, 164
- correlation coefficient, 159, 164
- cycles, 36

- data
 - anomaly dataset, 112–113
 - artifact, 94
 - central tendency, 134, 137
 - collection, 50, 55, 57
 - environmental, 86
 - existing, 86
 - filling gaps, 97–102, 156
 - plotting, 65, 93–97
 - precipitation, 79, 82
 - published, 75–76
 - qualitative, 49, 80
 - quantitative, 49, 80
 - range, 142
 - raw, 22, 89, 94, 97, 108
 - repositories, 75
 - residuals, 112–113
 - resolution, 86–88, 90, 156
 - results, 150
 - scientific, 75
 - smoothed, 156
 - temperature, 78
- distribution, exponential, 139
- distribution, normal, 134, 152
- Dome C. *See* EPICA Dome C
- dynamic systems, 171

- EarthChem, 76
- eccentricity, 127
- editing, 212–213
- El Niño, 57, 89, 111, 172
- ENSO, 89, 111, 172
- EPICA Dome C, 87, 127
- epifluorescence microscopy, 81
- equator, 41
- escapement, 139
- event, 45
- experiment, 80
- extrapolate, 98

238 INDEX

- figure captions, 30, 33
- figures, scientific, 22, 30–33
- forecasting, 50–51
- Fraser River, 136
 - discharge, 137
 - water level, 137
- frequency, 37
- Gantt Chart, 205
- Georef*, 75
- GISTEMP, 33
- glacial – interglacial cycle, 127
- Google Scholar*, 75
- graphs, 30–32, 68–69, *See also* bar graphs,
 - box plots, histograms, piecharts, scatterplots
 - default settings, 94
- histograms, 23, 33, 139, 141, 148–149
- hourglass metaphor for proposal writing, 201
- ice core, 86–87, 125
- implications, 216
- IMS. *See* International Monitoring System
- index, environmental, 54
- inflow, 187–190, 193
- intercept, 175
- interference, constructive, 108
- interference, destructive, 108
- Intergovernmental Panel on Climate Change, 193
- International Geophysical Year*, 56
- International Monitoring System, 52
- interpretation, 19
- introduction, 217–219
- IPCC. *See* Intergovernmental Panel on Climate Change
- Italy, 68, 77
- jargon, 66, 73
- Keeling Curve, 56
- Keeling, Charles David, vii, x, 55–57
- La Niña, 57
- line of best fit. *See* ordinary least squares
- linear regression, 175–184, 187
- literature, peer-reviewed, 75–76, 86, 106, 209
- literature, scientific, 71
- maps, 22, 29, 33
- Marine Geosciences Data System, 76
- Mauna Loa, 56, 89, 107, 113–114, 117, 122, 125, 145, 155
- Mauna Loa Observatory, vii–ix
- mean, 23, *See* average
- measurements
 - direct, 57, 86–87, 125
 - flask, 156
 - in situ*, 81, 89, 156
 - indirect, 58, 86
 - proxy, 58, 125
- median, 23, 134, 152
- metadata, 77, 90–94, 156
- methodology, 66
- methods, 15–16, 203, 216, 223
- mode, 134, 152
- models, 171
 - conceptual, 171, 192
 - environmental, 171
 - linear, 175–180
 - mathematical, 174
 - organismal, 171
 - physical, 171
 - simple. *See* models, linear
 - stock and flow, 187–189
- monitoring, environmental, 50–52, 54
- motivation, scientific, 216
- NAN. *See* Not a Number
- NASA Goddard Earth Sciences Data and Information Services Center, 76
- National Centre for Atmospheric Research, 76
- National Climatic Data Center, 75
- NERC Data Centres, 76
- Not a Number (NAN), 94
- Oak Ridge National Laboratory Distributed Active Archive Center, 76
- obliquity, 127
- Occams Razor, 175
- ordinary least squares, 98–102, 175
- outflow, 187, 190, 193
- outline, 211
- oxygen isotope ratios, 58
- paleoclimate, 86
- PANGAEA, 76
- Paris Agreement*, 53
- peer review, 11–12

- photosynthesis, viii, 106, 114, 145, 151, 160, 168, 171, 190
- pie chart, 26, 33
- plate tectonics, 45
- PM_{2.5}, 71, 81–82
- Point Barrow, Alaska, 155
- pollution, 71
- precession, 127
- process, 45
- proposal
- budget, 204
 - context, 202
 - headings, 207
 - implications, 205
 - outline, 207
 - relevance, 14–15, 202
 - subheadings, 207
 - timeline, 204
- question, scientific, 216
- questions, research, 203, 224
- questions, scoping, 64–66, 73
- random noise, 117–118, 128–129
- references, 202, 207–210, 223
- regulations, environmental, 51
- respiration, viii, 106, 114, 145, 152, 160, 168, 172, 190
- results, 16–19, 216
- scale
- space, 36, 41–45, 54, 79, 87
 - time, 36–43, 54, 79–80, 87, 93, 118–122, 174, 191
- scatterplots, 27–29, 32–33, 93
- science, communication, 11, 22, 207, 227
- title, 13–14
- science, process, 11, 73
- scientific method, 11
- scoping, project, 206
- Scripps CO₂ Program, 89, 155
- Scripps Institution of Oceanography, ix, 56, 103
- SEANOE, 76
- seasonal cycle, 41, 114, 156, 164–168, 171
- CO₂, 108, 145, 155, 160, 173
- signal dominance, 166
- sinks. *See* outflow
- skew, 23, 135, 137, 149
- slope, 175
- sources. *See* inflow
- South Pole, 56, 155
- speleothems, 58
- stalactites, 58
- stalagmites, 58
- standard deviation, 142, 144, 152
- standards, environmental. *See* regulations, environmental
- stock, 187, 189–190
- Strategic Biodiversity Plan 2011–2020*, 53
- sunscreen, 69, 81–83
- tables, 22, 204–205
- tilt, 40, 127
- timeframe, 86
- timeline, 223
- timeseries, 27, 37, 44
- trend, 107, 145, 157
- UN. *See* United Nations
- United Nations, 52
- United Nations Climate Change Conference of the Parties, 53
- variability
- annual, 57, 114, *See also* annual cycle
 - daily, 18, 41
 - decadal, 18
 - interannual, 172
 - monthly, 148
 - seasonal, 23–24, 38, 137, 191, *See also* seasonal cycle
- variable, dependent, 27, 32
- variable, independent, 27, 32, 80
- variance, 143
- volcanism, 46
- WAIS. *See* West Antarctic Ice Sheet
- wavelength, 36
- Web of Science*, 75, 86
- West Antarctic Ice Sheet, 88
- winegrape, 68, 77–78
- World Data Center for Climate, 76
- writing
- paragraphs, 207, 212
 - persuasively, 200
- zones
- polar, 41, 44
 - temperate, 41, 44
 - tropical, 41, 44
- zooxanthellae, 80