INDEX

Aegean amphoras, 135, 139
Aegean Bronze Age, 8, 61–62, 82–83, 89–90
timber and distance, 62–63
Kalaminos, 79–82, 80–81f
maritime communities in, 88–89
multi-scalar network model, 67–72
multi-scalar network model, 72–73, 74f
Mycenaean anchorages and harbors, 67–68
regional/intra-cultural maritime interaction, 75–76
Saronic Gulf, 73, 76–82, 77f, 78f, 80–83f
scalar issues, 63–67, 64f
affiliation networks, 222, 225–227f, 231f, 232, 245
Agammemnon (Aeschylus), 105
agent, 41, 44, 95, 97, 99, 113, 117
Agent-Based Models (ABMs), 22–23, 30
agricultural production, 187
amphora magnum, 229
amphorae
Aegean amphoras, 135, 139
archeological setting and, 164–167, 166–167f
basket-handle amphoras, 139, 142
Byzantine maritime trade, 219–232, 228f, 231f
co-occurrences of amphoras, 9
Corinthian A amphoras, 139
Hellenistic Rhodian amphoras, 181
location of shipwrecks and, 12
Massaliot amphoras, 150
Tan Fabric Southern Ionian amphoras, 146
Antoine Itineraries, 23
Aperlae, 118
aphidroma, 115
aphis, 106
Apollo, 98, 99, 100f, 102, 116, 117
archon model, 30f, 30
Artemis, 99, 102, 103, 104–105, 109, 112–113, 115, 117
artifacts, 2, 3, 8, 13, 94, 135. see also amphoras; table-ware distribution in Roman Eastern Mediterranean
Athenian Agora, 166
Athenian cups, 135
Attic finewares, 135
Average Weighted Distance, 36
bipartite network, 223f, 224
Brainerd-Robinson coefficient
distribution of, 194–197, 195–196f, 198–199t
overview of, 199f, 199t, 194, 212
Braudel, Fernand, 5
British rule on Cyprus, 11
Bronze Age. see also Aegean Bronze Age
Early Bronze Age (EBA) Cyclades, 7, 77
Late Bronze Age (LBA), 7, 39, 103, 118
Middle Bronze Age, 7, 39, 42, 71
prehistoric record, 7, 9
Bronze Age Eastern Mediterranean, 39
Bronze Age Ugurian, 71
Bronze and Iron Age Mesopotamia, 39
Brownian motion, 11, 108
bulk artifact distributions, 13
bulk commodities, 3
Byzantine kommerkiarioi, 228
Byzantine maritime trade, 219–232, 223f, 225–227f, 228f, 231f
cabotage, 111f, 116
Cala Sant Vicenç shipwreck, 151
Christianity, 87, 88
cultic practices, 96, 101–106, 102f, 251
clustering coefficients, 200, 207–208, 208f
country-hugging, 13
coastscapes, 73, 84, 86–87
commom sense knowledge, 107
corruption
connectivity, 97, 113f, 116
hyper-connected modern world, 1
maximum connectivity, 110–111
past maritime connectivity, 215
Cornithian Gulf coast, 68
The Corrupting Sea (Horden, Purcell), 5, 72, 94, 101, 118
cosmopolitanism, 240, 241, 249
cross-cultural maritime interaction. see maritime interaction
cultural interaction, 13, 15, 16, 66
Cycladic longboat, 62
“Dark Age” world, 119
demure the Bacchid, 155

257
INDEX

Demeter Sanctuary, 165
deterrence function, 26, 45
Diana Ephesica, 116
Dionysius of Halicarnassus, 155
Directed Proximal Point Analysis (Directed PPA),
direzione system, 232
distances in social network analysis, 23–24
distribution patterns, 211
Dorcan Hexagon, 118
Doubly Constrained Gravity Model (DCGM), 28
Early Bronze Age (EBA) Cyclades, 7, 69, 77
Early Iron Age, 10, 103
Early Modern era, 9
eastern networks, 44–45
Eastern Sigillata, 187, 200, 206, 209–210,
e114–217, 246
ecology in Mediterranean prehistory, 1–2
economic networks. see religious and economic networks
e the Greco-Roman Mediterranean
economic organization, 84
effort in social network analysis, 23–24
effective distance, 42
ego networks, 145, 147f
Egyptian New Kingdom, 63
Eigenvalue centrality, 33
entropy, 41–42, 46
environmental constraints of the sea, 3, 4, 12
epistemic approach of entropy, 46
epiteichismata, 115
ethnoarchaeology of maritime coastal community
assumptions and hypotheses, 83–84
introduction to, 83
maritime habitus, 84–86, 85f
overview of, 83–88, 85f
peripheral status and identity formation, 87–88
summary of, 253
Euboean Gulf, 102–103, 104–105, 106–107
expedia, 106
expert knowledge, 107, 250
exploratory network analysis, 187, 209–210, 212
Exponential Random Graph models, 30
face-to-face basis of ancient societies, 1, 2, 3, 73
fishermen, 94
Flotilla Fresco, 63
ForceAdas2 graph, 151, 151f, 153–154f
Foucault, Michel, 137, 249
fraction of effort, 71
friendship bias, 178
Gela shipwreck, 153
Geographic Information Systems (GIS), 22–23, 186
Geometric Greece, 39
Gephi software, 151, 152–153, 223
global network measures, 112–113, 200, 201f, 202f,
203f, 204f, 205f, 206f
globalization, 81, 133, 155, 247
Goldilocks scenario, 54
goods to market model, 138
“grammar” (and stylistic change model), 172
Grand Ribaud F shipwreck, 151
gravitational pull, 71, 97
gravity models, 26–28, 27f
Greco-Roman Mediterranean. see religious and eco-

tic networks in the Greco-Roman Mediterranean
Greek colonization, 12
Greek myth, 96
Greek polytheism, 96
hegemon, 114
Hellenistic Delos, 102
Hellenistic Rhodian amphoras, 181
Hellenistic world, 10
Hierarchical Clustering Methods, 33
Hinduism, 88
Hittite New Kingdom, 63
human cargo, 219
hypothetical “trade network,” 132–133
ICRATES (Inventory of Crafts and Trade in the
Roman East), 188, 193, 209
identity formation, 87–88
imperfect optimization model, 71–72
inside-out geography, 5
interaction distance, 73
interactions in social network analysis, 23–25
intermarriage ties, 249
international spirit, 78
interregional/intercultural maritime interaction
sphere, 9, 48, 51, 73, 76, 82, 154
Intervening Opportunity Model, 45, 50
intervisibility, 73, 76, 87
intraregional/intercultural maritime interaction
sphere, 73, 76, 146, 147, 154, 248
Ionian cups, 135, 142, 150
Iphigenia in Tauris
iron Age Mediterranean, 95
Kalamianos, 79–82, 80–81f
Kekova Adas shipwreck, 139, 142, 143f
Kepçe Burnu shipwreck, 151
Kerali (India) fishing communities, 84–85
Kolonna, 77–79, 78f
krateriskoi
Kristiansen, Kristian, 153
La Méditerranée et le monde méditerranéen à l’époque de
Philippe II (Braudel), 3
landscape learning, 240
Language Change model, 172–175, 173f, 174f,
175f, 177
Late Bronze Age (LBA), 7, 39, 103, 118. see also
Aegean Bronze Age
Late Minoan IA (LM IA) period, 48, 55, 56
INDEX 259

Late Minoan IB (LM IB) period, 48, 55
Latenian Northern Europe, 39
Liburna project, 231
linear cost model, 26
logarithmic cost model, 26
long distance trips, 27
long duce, 114

The Making of the Middle Sea (Broodhank), 5, 94
maritime habitus, 84–86, 85f, 240
maritime interaction, 1–2, 6–7, 66
maritime networks, see also archaeological social networks; networks/network models; religious and economic networks in the Graeco-Roman Mediterranean
Byzantine maritime trade, 210–232, 228f, 231f
communication, 9, 15
creating connections, 1–3
local-scale maritime networks, 61–62
Mediterranean maritime interaction, 1–2, 6–7, 9–16
mobility considerations, 3–9
multi-scalar framework, 67–73, 74f
past maritime connectivity, 213
religious networks, 250–251
terrestrial networks vs., 239–241
maritime small world, 73–75
Massaliot amphorae, 150
material culture, 83, 222
material diasporas, 2
maximum distance network (MDN), 28, 20f
maximum entropy principle, 26
Mediterranean maritime interaction, 1–2, 6–7, 9–16
memory work, 241, 250–251
Mesoscopic approaches, 22
micro-ecologies, 5
microcanonical ensembles, 46
Middle Bronze Age (MBA), 7, 39, 42, 71
middle ground, 136–137
Middle Helladic (MH) period, 28
mimicry model of amphorae, 168–172, 169f, 171f, 175–177
miniature continents, 5, 12
mobility considerations, 1, 3–9
model discrepancy, 39
modeling
archaeological and historical data, 15–16
cultural interaction, 11
environmental variables, 3–4, 138
general approach to, 22–24
interactions, 24–25
networks of interaction, 142
ontic approach, 46
prehistoric periods, 69
relational thinking and, 242
simulation modeling, 244
social variables, 3–4
technological parameters, 138

variability in, 243–244
modern transport systems, 26
Monte Carlo approaches, 22, 30
most likely networks, 47–48, 49f
movement of goods (dirigisme), 229
multi-scalar framework, 67–73, 74f
multithrical middle ground, 137
Muslims, 88
mutation-rate settings, 169, 174
Mycenaean coastal worlds, 67–72
Mycenaean economy, 81
Mycenaean Greeks, 63–67
natural experiments in history, 40
Neolithic age, 7, 9, 69
Netlogo Mimicry model, 160f
network metaphors, 8
network science, defined, 185f, 186
networks/network models, see also maritime networks; religious and economic networks in the Graeco-Roman Mediterranean; robust social network analysis; social networks
affiliation networks, 222, 225–227f, 231f, 232, 245
Archaic through Hellenistic amphora record, 173–177
archaeological setting and, 164–167, 166–167f
bipartite network, 223f, 224
Byzantine maritime trade, 219–232, 228f, 231f
complete networks, 194
cost-benefit models, 51
description in robust social network analysis, 25, 26f
easiest networks, 44–45
go network for analysis, 145, 147f
exploratory network analysis, 187, 209–210, 212
global network measures, 112–113, 200, 201f, 202f, 203f, 204f, 205f, 206f
hypothetical “trade network,” 132–133
introduction to, 163–164
Language Change model, 172, 173f, 174f, 175f, 177
local-scale maritime networks, 61–62
mimicry model, 168–172, 169f, 171f, 175–177
model discrepancy, 39
node rankings, 200, 207–208, 208f
onomata, 114
Odyssey (Homer), 76
one-mode networks, 152, 222, 246
onward distribution patterns, 165
Pabuç Burnu shipwreck, 139, 140f, 147, 149
Pactio Sicardi, 230
paleocoastal reconstruction, 79
INDEX

Pearson correlation coefficients, 33
Peloponnesian War, 109, 111
personal possessions from shipwrecks, 13
Pointe Lequin IA shipwreck, 133, 142, 151
political power, 84, 239
ports and harbors
  guardian of harbors, 104
  Mycenaean anchorages and harbors, 67–68
pottery, 12, 79, 94
Mycenaean-style, 79
premodern sea travel, 62
presence/absence technique, 191
Principal Component Analysis (PCA), 33, 36
Principle of Insufficient Reason, 41, 45
Principle of Maximum Ignorance, 41
progradational (advancing seaward) shorelines, 67
proletarians at sea, 109
proteleia, defined, 105–106
Proximal Point Analysis (PPA), 8, 28, 29f, 44, 69, 70, 238
pyrrhichia, 104
Radiation Model, 45, 50, 52f, 55, 56
recessive (eroding landward) shorelines, 67
refugee plight, 5
regional capital, 25
regional/intra-cultural maritime interaction sphere, 75–76
religious and economic networks in the Greco-
  Roman Mediterranean, 250–251
cabotage connectivity, 97, 113f, 116
celtic practices, 96, 101–106, 102f, 251
cults and cabotage, 101–106, 102f
global networkedness, 112–113
introduction to, 5, 93–98
maritime knowledge, 106–107
maximum connectivity, 110–111
qualitative approach, 98–101, 100f
weak ties, 108–110
Rihill and Wilson Gravity Models (RWGMs), 25, 15f, 36
Roman Empire, 10
Roman Mediterranean, 7
Royal Tombs at Salamis, 155
Saronic Gulf, 73, 76–82, 77f, 78f, 80–81f, 84
Saronic Harbors Archaeological Research Project (SHARP), 79, 83
Scandinavian archaeology, 6
seaborne routes, 7, 9
sensitivity analysis, 194
Shaft Grave period, 71, 79
shipwrecks. see also individually named shipwrecks
  amphorae and, 12
  analysis of, 241, 246
  introduction to, 6, 132–136, 134f
  middle grounds, 136–137
  as mobile nodes, 12
  social network graphing, 145–149, 147f, 148f
  social relationships and, 154–157, 156f
  visualization of, 149–154, 151f, 153–154f
  zones of interaction, 138, 140f, 141f, 143f, 144f, 155–156f
  similarity networks for tableware, 192–193
  Simple Gravity Model (SGM), 27, 51, 55
  small coastal settlements, 77
  A Small Creek World (Malkin), 97
  small world model, 73–75, 247
  smallest-scale entities, 22
  social bonds, 3
  social integration, 109
Social Network Analysis (SNA)
  analysis of, 242f, 247
  comparison of networks, 31–36, 32f, 33f, 34f, 35f
  culture, heterogeneity and, 248–249
  distances, 23–24
  edges, 23–24
  graphing of shipwrecks, 145–149, 147f, 148f
  gravity models, 26–28, 27f
  growth of, 96
  interactions, 23–25
  introduction to, 8, 22–24, 238–239
  maritime vs. terrestrial networks, 239–241
  maximum distance network, 28, 29f
  memory work, 241, 250–251
  modeling scales, 22–23
  network description, 25, 26f
  proximal point analysis, 28, 29f
  religion and, 250–251
  site-centric social network analysis, 23
  statistical measurements, 226
  stochastic model, 28–31, 30f
  summary of, 36, 252–253
  technological innovation, 247–248
  vertex-centric social network analysis, 23
  social organization, 84
  social potential, 43
  social relationships and shipwrecks, 154–157, 156f
  social thermodynamics, 46
  socioeconomic considerations, 12
  spatial distribution of artifacts, 8
  spatial network analysis, 238
  state-supplied food, 228
  stochastic model, 28–31, 30f
  strength of weak ties, 108–110
  structuring logic to coastal life, 83–84
  symbolic artifacts, 2
INDEX 261

tableware distribution in Roman Eastern Mediterranean
Brainerd-Robinson coefficient, 190f, 192f, 194, 212
Brainerd-Robinson coefficient, distribution of, 194–197, 195–196f, 198–199f
clustering coefficients, 200, 207–208, 208f
Brainerd-Robinson coefficient, distribution of, 198–197, 195–196f, 198–199f
data, 188–189, 189f, 189f
exploratory network analysis, 187, 209–210, 212
global network measures, 200, 201f, 202f, 203f, 204f, 205f, 206f
node rankings, 200, 207–208, 208f
per 25-year period, 208–209, 214–217
similarity networks, 192–193
summary of, 211–213
Tan Fabric Southern Ionian amphoras, 146
Technological innovation and network dynamics, 247–248
Terrestrial networks, 3, 219–244
Theran eruption
agency and, 41
easiest networks, 45, 47f
immediate post-eruption networks, 54–55
later post-eruption networks, 55–56
Minoan culture, 47, 48f
most likely networks, 41–44, 43f
outlook, 57
overview, 39–40
pre-eruption networks, 48–54, 49f, 52f
Thiessen polygons (Voronoi Diagrams), 25
Third Science Revolution, 242
Topological sensitivity, 39
trade and commerce
benefits of, 71
Byzantine maritime trade, 219–232, 228f, 231f
hypothesised “trade network,” 132–133
Roman commerce, 12
Traditional Social Network Analysis (SNA), 23
Trojan War cycle, 103
two-mode network, 246
Uluburun shipwreck, 248
uninformative results, 211
Viking Age Scandinavia, 230
Visualization of shipwrecks, 149, 153–154f
Vita Ansgarii (Sindbæk), 23
Works and Days (Hesiod), 75–76
Xoanon, 114
Xent model, 25
zones of control models, 25, 31
zones of interaction, 138, 140f, 143f, 144f, 155, 156f