

Index

(Terms within papers collected in Part II are not included)

A

Absorptivity, 22
Afforestation, 48, 50
Age of water, 33, *see* Residence time
Aira-Gawa in Japan, 14, 30, 44
Alluvial fan, 34
Altimetry measurement, 53
Aquaculture farm, 9, 46, *see* Shrimp pond
Animal
 burrow
 characteristics of —, 12, 43–45, 52, 53, 526
 hydrodynamics of —, 6, 10, 40, 53, 54, 449
 role of —, 6, 15, 19, 43–45, 53, 567
 mound, 43–44, 45
Anoxic, 9, 15, 21–22, 45
Artificial dyke, 31, 32, *see* Embankment
Astronomical, 22, 31, 32
Asymmetry
 between flood and ebb tides
 in water surface, 16, 24, 25, 44, 103
 in water flow, 18, 37, 46, 103
Atmospheric
 pressure, 28
 process, 8, 13, 21–22, 28–29, 45–46
Averaged age, 33, *see* Residence time
Avicennia sp., 13

B

Babeldaob Island in Palau, 23
Basin forest-type (B-type)
 characteristics of —, 15, 16, 21, 22, 41
 definition of —, 7, 11–12
 role of —, 19, 21, 22
Bashita-Minato in Japan, 22, 23, 320, 431
Benthos, 34, 46, 56
 life-cycle of —, 37
Biodiversity, 9, 24, 25, 26

Bio-geomorphology, 3, 43, 45, 46
Biomass flow, 55
Biota, 34, 43–45, 46
Bioturbation, 12
Biotic activity, 3, 12, 21, 22, 46, 56
Bore, 31, 41–42
Bottom substrate
 condition of —, 12–13, 42, *see* Sediment, Soil
 elevation of —, 3
 friction due to —, 16, 31, 34, 45
 slope of —, 12
Brackish water, 16
Bruguiera sp., 13, 14, 54
Buoyancy effect
 sediment-induced —, 37, *see* Sediment
 in tidal creek, *see* Water density

C

Can-Gio in Vietnam, 14, 28, 29, 49
Catchment area, 16
Capillary vessel in human body, 9, 46
Centroid of seed, 48
Chone River (Rio-Cone) in Ecuador, 14, 28, 29
Coastal
 erosion, 5–6, 7, 18, 26, 33, 48–49, 583
 protection, 5–6, 15, 36, 42, 181
Cocoa Creek in Australia, 13, 20, 21
Coral Creek in Australia, 9, 14
Coral reef, 21, 22–23
Crab pond, 35, *see* Aquaculture farm
Crocodile Creek in Australia, 20, 21
Cuddalore in India, 41
Cyclone, 35

D

Darcy's law, 40
Darwin Harbor in Asustralia, 10
Deforestation, 3, 10, 47, 48, *see* Thinning

Deformation
 of topography, 10, 55
 of tide, 24, 25, 26, 44, *see* Asymmetry, Tidal deformation

Degradation
 of mangrove colony, 3, 10, 55
 of sediment quality, 50, *see* Sediment
 of water quality, 50, *see* Water property

Density
 flow, 36, 37, 38, 39
 of mangrove seed, 48
 of vegetation, *see* Mangrove vegetation
 of water, *see* Water density

Destruction of mangrove forests by human action, 3, 4, 47–48, 55, *see* Human action

Diffusion, 89

Dispersion
 coefficient, 55, 559
 due to turbulence, 16
 of dissolved/suspended material, 9, 24, 25, 36–37, 47–48, 559
 of mangrove seed, 9, 18, 44, 47, 559

Dissolved oxygen, 21–23, 29, 44, 45

Diurnal variation
 in solar radiation, 28
 of tidal action, 5, 7, 22–23, 29–30, 34

Dominant tidal constituent, 29–30

Drag
 coefficient due to vegetation
 against sea waves, 35–36
 against tidal flow, 34
 force due to vegetation
 against sea wave, 10, 15, 21, 31
 against tidal flow, 5, 16, 34, 35, 43–44, 47–48, 53–54, 135
 against tsunami, 41–42

Dry season, 11, 16, 18, 21, 37, 41, 265

E

Eco-hydrology, 8, 10, 24, 58

Eddy motion
 of water, 12, 27, 31, 36, 46
 viscosity, 34, 35
 coefficient of —, 34

Embankment, 35, *see* Artificial dyke

Electric conductivity, 52

Eustacy, 46

Eutrophic, 15, 26

Evaporation, 8, 16, 19, 21, 24, 25, 26, 45, 223

Evapotranspiration, 16, 19, 21, 24, 25, 26, 45

F

Feedback system, 4, 9, 24, 33–34, 43–50, 55–56, 58, *see* Interrelation

Flushing
 tidal —, 458, 469
 time, 52

Fortnightly change, 28, 51

Free oscillation of swamp water, 31

Freshwater discharge, 19, 21

Fringe forest-type (F-type)
 characteristics of —, 7, 13, 16, 19, 24, 26, 31, 35, 48
 definition of —, 7, 11–12
 role of —, 7, 15, 19, 24, 26, 31, 48–49

Fukido-Gawa in Japan, 9

G

Geo-ecosystem, 10

Geophysical resistivity array, 52

Global
 sea level change, 46
 warming, 33, 35

Gordon Creek in Australia, 12, 44

Gravitational circulation, 18–19, 24, 25, *see* Water circulation, Water density

Groundwater
 flow, 6, 11, 19, 24, 25, 26, 39–41, 431
 flux, 15–16, 28
 table, 19, 39–41, 52
 permeability, 6, 15, 19, 40
 property, 6, 21, 514

Growth of mangrove forest, 24, 25, 26, 44, *see* Recovery of mangrove colony

H

Heat budget on tidal flat, 23, 45

Hinchinbrook Channel in Australia, 7, 10, 33, 53, 58, 295

Hong River in Vietnam, 31

Human action, 47–50, 55, 56, 583

Humidity in mangrove swamp, 8, 21, 45

Hydraulic
 conductivity, 10, 39–41, 52, 533
 function, 6, 8, 27, 36–38, 41–42, 204
 mechanism, 5–8, 34–42

Hydrodynamics
 of groundwater, 10, 39–41
 of tidal flow, 3, 9, 15, 34, 36–39, 57–58, 69, 147
 of sea waves, 15, 16, 21, 27, 35–36, 57

of tsunami, 41–42
 supporting mangrove ecosystem, 3, 27, 46,
 337
 Hydrology, 24, *see* Terrestrial process
 Hypersalinity, 8, 16, 19, 20, 45

I

Impermeable layer, 40
 Indian Ocean Tsunami, 6, 32, 41, *see* Sumatra
 tsunami
 Inertial force of tsunami, 41
 Interdisciplinary collaboration, 51, 58
 Interrelation
 between
 atmosphere and water flow, 45
 biota and atmosphere, 45
 biota and landform, 43
 biota and water flow, 34, 44, 156
 different mechanisms, 33–34, 320, 337,
 583
 landform and atmosphere, 45
 tidal creek and mangrove swamp, 16, 17–19,
 24–25, 27, 36, 46, 48–49, 53–54, 142
 water flow and landform, 45, 69, 89, 103, 111,
 123
 Inverse estuary, 18, 19, 24, 25
 Iriomote Island in Japan, 12, 14, 19, 22, 30, 44, 45
 Ishigaki Island in Japan, 6, 9, 28, 29

K

Kandelia sp., 10
 Katchall Island in Indian Ocean, 42
 Kinetic energy
 of sea waves, 31, 35–36, 49
 of tidal flow, 36
 of tsunami, 42
 Klang Strait in Malaysia, 10, 50, 547
 Klong Ngao in Thailand, 8, 33, 233
 Konkoure River in Guinea, 8, 575

L

Laboratory experiment, 10, 36, 42, 53
Laguncularia sp., 13
 Landform
 classification of —, 7, 11–12
 of mangrove area, 11–12
 Light absorptivity, 22
 Long Hoa in Vietnam, 29, 48–49

Lumnitzera sp., 13
 Lunar cycle, 28
 Lutocline, 37, *see* Water density

M

Maira-Gawa in Japan, 12, 14, 19, 45
 Majagual in Equador, 9
 Management of mangrove environment, 48
 Mangrove
 colony, 10, 47–48, *see* Recovery
 ecosystem
 conservation, 3, 5
 interdisciplinary research on —, 3, 57–58
 supported by physical environment, 5–10,
 35–36, 52
 sustainability of —, 3, 9, 46, 47–50
 environment, 6–9
 preservation and utilization of —, 3, 27, 54,
 55–56, 57–58
 swamp
 biota of —, *see* Animal, Benthos, Biota
 sediment of —, *see* Sediment
 topography of —, *see* Topography
 vegetation of —, *see* Mangrove vegetation
 water elevation of —, *see* Water surface
 water flow of —, *see* Water flow
 water quality of —, *see* Water property
 vegetation, 13–15
 density, 5–6, 13, 47–48, 49, 52, 55
 horizontal distribution of —, 36, 54
 vertical configuration of —, 6, 13, 53, 54
 width, 49
 Material
 distribution in tidal creek
 along creek, 18–19, 36–39
 cross section, 18–19, 37, 52
 vertical —, 36–39, 48, 52
 exchange
 between mangrove area and open sea, 5, 7,
 18, 36–39, 45, 52, 279, 295, 320
 mechanism of —, 7
 transport, 24, 25, 36, 45, 46, 51, 52
 trapping into mangrove swamp, 9, 10
 Mekong River in Vietnam, 22, 385
 Mixing
 due to groundwater flow, 41
 due to tide, *see* waves and river discharge, 7,
 15, 233, 282
 due to water turbulence, 52
 Model
 classifying mangrove colonies, 33
 for mangrove swamp, 53–54

for tidal creek, 53–54
 kinematic —, 10
 mathematical —, 8, 10, 42, 53
 method of —, 55–56
 multiple-box —, 10
 nesting —, 9, 54
 two-way —, 9
 numerical —, 9, 37, 47
 of ecohydrology, 10
 of ecosystem, 10, 55
 of food-web, 10, 55
 of hydrodynamics, 10, 53–54, 55–56
 of hydrodynamics-sedimentation, 10, 55
 of material transport/dispersion, 16, 55
 of suspended material, 55
 of water circulation, 16
 one-dimensional —, 9
 POM (Princeton Ocean Model —), 53
 two-dimensional —, 9
 Mesh —, 9, 53
 WD-POM —, 53
 Monsoon, 28
 Mud
 flat, 22
 floc, 36, 361
 lobster, 43
 Mui Nai in Vietnam, 48, 49

N

Nakama-Gawa in Japan, 14
 Negative estuary, *see* Inverse estuary
 Nicobar Island in Indian Ocean, 42
 Normanby River in Australia, 37
 Nursery for aquatic life, 49

O

Offshore process, 22–23
 Oxygen supply, 21, 22–23, *see* Anoxic

P

Paradox
 between preservation and utilization, 49–50
 of afforestation, 49
 Photopsynthesis
 in mangrove swamp, 21
 on coral reef, 22, 29
 Phytosociology of mangrove, 3

Physical
 factor forming mangrove environment, 4, 11–26
 process in mangrove environment, 3–4, 6, 9, 15, 24–26, 43, 57–58
 Physiology of mangrove, 3, 55
 Porosity in soil, 40
 Potential flow, 38, 39
 Prawn larvae, 10, 47
 Prawn farm, 38, 46, 50, *see* Shrimp pond

R

Rainfall
 seasonal —, 9, 15, 20, 21, 28, 45
 Rate of wave reduction, 31, 36, *see* Sea waves
 Recovery of mangrove colony, 10, 24, 25, 47–48
 Red River in Vietnam, 22
 Reforestation, 49
 Representative length scale in mangrove swamp, 13, 14, 34, 54
 Residence time, 33, 37, 52
 Resistance of mangrove trees and roots, 11, 16, 21, 34
 Resonant oscillation, 31, *see* Seiche
 Respiration, 22, 29
Rhizophora sp., 6, 13, 14, 15, 44, 54
 Rice farming, 8, 49
 Rio-Chone in Equador, 14, 28
 River discharge, 9, 21, 36, 52, *see* Terrestrial process
 Riverine forest-type (R-type)
 characteristics of —, 9, 13, 15, 24, 31, 34, 35, 52, 142, 490
 definition of —, 7, 11–12
 role of —, 9, 15, 24, 36, 40, 47, 50, 142
 Rule of hydrodynamic similarity, 53

S

Sacrificial barrier, 6, 15, 42
 Salinity
 intrusion by tidal period, 5, 44, 575
 maximum zone in tidal creek, 16, 18, 19, 20, 21, 45, 223
 Salt
 flat, 21, 255, 505
 particle, 21
 spray behind mangrove forest, 8, 15, 21
 San Francisco Bay in USA, 53
 Sawi Bay in Thailand, 7, 8, 10, 58
 Seagrass, 22

Seasonal change
 in climate, 28
 in rainfall, 28, *see* Rainfall
 in sea level, 28, 29, 30, 33, 35, 51, *see* Water surface

Sea waves
 action of —, 169
 hydrodynamics of —, *see* Hydrodynamics
 reduction of —
 due to mangrove vegetation, 5–6, 10, 21, 24, 25, 26, 31, 35–36, 49, 190
 due to bottom friction, 23, 31, 35
 rate of —, *see* Rate of wave reduction

Secondary circulation in tidal creek, 24, 25, 36, *see* Water circulation

Sediment
 cohesive —, 10, 36
 deposition of —, 9, 24, 25, 31, 34, 48, 403
 dynamics, 385
 movement/transport of —, 7, 16, 23, 171, 359
 of bottom, 12, 15, 45, 48, 55
 particle size of —, 12, 15, 40
 suspended —, 18, 37, 411
 trapping, 105
 unconsolidated —, 33

Seiche, 28, 31, *see* Resonant oscillation

Seismic sea wave, 6, *see* Tsunami

Self-organization, 10

Semi-diurnal tidal period, 5, 7, 22, 29–30, 33–34, 35, 51

Shelter of ecosystem, 10, 35

Shrimp pond, 31, 35, 42, *see* Aquaculture farm

Sill bathymetry in tidal creek, 37

Sluice gate, 38, 39

Soil
 in organic clay and humus, 9, 12, 13, 19, 40, 41
 property, 6, 503
 temperature, 28

Solar radiation, 15, 21, 22, 23, 30, 43

Solitary wave, 30

Song Hong (Hong River) in Vietnam, 31

Sonneratia sp., 10, 13, 15, 190

Spring-neap cycle, 28, *see* Fortnightly change

Statistical tidal inundation characteristics, 34, 44

Sumatra tsunami, 31, 41–42

Sungai Merbok in Malaysia, 36

Surface water and groundwater in mangrove swamp, 15

Surge, 31

Swell, 15, 31

T

Tamil Nadu in India, 41

Terrestrial process, 8, 23–24, *see* River discharge

Thanh Phu in Vietnam, 9, 21, 38

Thinning, 10, 47–48

Threshold condition for uprooting underground root, 42

Thui Hai in Vietnam, 35

Tidal
 creek
 formation mechanism of —, 8
 meandering —, 5, 7, 9, 18, 37, 54
 network of —, 8, 9, 38, 46
 role of —, 7
 siltation of —, 9, 46, *see* Asymmetry
 tributaries of —, 7, 9, 38, 46, 54
 deformation, 5, 55, 156
 elevation, 14, 29, 33, 34, 44, 53, 55
 flat, 23, 24, 25, 41, 255
 flow
 in mangrove creek, 3, 5, 7, 9, 11, 15, 17–19, 37, 48, 53, 55, 57
 in mangrove swamp, 3, 9, 11, 15, 16, 31, 34, 36, 52, 53, 55, 57
 harmonic
 analysis, 53
 constituent, 29
 hydrodynamics, 14, 36–39, *see* Hydrodynamics
 inequality, 30, 51
 inundation, 26, 28, 40, 44, 47, 51, 156
 duration of —, 9, 30, 33, 44
 frequency of —, 9, 24, 30, 33, 44
 mixing, *see* Mixing
 prism, 9, 24, 25, 30, 44
 range, 30, 36, 40, 51, 52
 regime, 3, 34
 stage, 34, 36, 51
 trapping, 9, 10, 37, 47, 50, 233, 282, 295, *see* Dispersion

Tong King delta in Vietnam, 10, 181

Topography
 deformation of —, 9, 55
 formation of —, 8, 10, 36
 fractal pattern of —, 8, 10
 linking physical process, 8, 24–26, 320
 of mangrove swamp, 7

Transitional change
 in coastal erosion, 48
 in ecosystem, *see* Feedback system

Transit time, 33, *see* Residence time

Tree canopy, 8, 21–22
 shading by —, 21, 24, 25, 26

Tropical depression, 31, 35

Tsunami, 6, 8, 15, 23, 28, 31–32, 41–42, 53, 204
 Tuff Crater in New Zealand, 52
 Turbidity in tidal creek, 10, 36, 37
 Turbulent zone, 15
 Turn-over time, 33, *see* Residence time
 Typhoon, 8, 15, 23, 31, 32, 35

V

Vascular system in mangrove area, 46, *see*
 Capillary vessel in human body
 Velocity shear, 36
 Viscous force due to mangrove tree/root, 16, 34,
 53, 54

W

Wake by sightseeing boat, 33
 Wave

amplitude, 35, 49
 inundation, 26
 height, 35–36
 period, 6, 31, 36
 spectrum, 28, 36

Water

circulation, 7, 9
 vertical —, 17–19, 21, 36, 52
 secondary —, 18, 36–37, 111
 density
 interface, 22

in tidal creek, 9, 21, 37, 38–39
 maximum zone of —, 16, *see* Salinity
 maximum zone
 stratification of —, 15, 21, 36, 37, 48
 vertical gradient of —, 9, 37, 469, *see*
 Gravitational circulation
 exchange, 5, 9, 15, 21, 33, 37, 38–39, 46, 49
 flow
 in tidal creek, 11, 17–19, 52
 in mangrove swamp, 11, 44–45
 flux
 in tidal creek, 9, 17
 underground —, 6
 property, 6–7, 15–16, 21, 22, 24, 25, 26, 38,
 41, 51, 52
 formation of —, 221
 degradation of —, *see* Degradation
 storage in mangrove swamp, 9, 50
 surface
 gradient in —, 11, 14, 34
 level, 14, 21, 23, 27, 30, 31, 33, 51–53, *see*
 Seasonal change in sea level
 turbulence, 31, 34, 36
 three-dimensional —, 36
 mechanism of —, 36
 role of —, 36, 361
 vapor, 45
 Wet season, 11, 21, 45
 Wind
 stress, 24, 25, 26, 34
 wave, 31