

WATER ENCYCLOPEDIA



Surface and Agricultural Water

Edited by
JAY H. LEHR
JACK KEELEY

CONTENTS

<i>Preface</i>	<i>ix</i>	Greenhouse Gas Emissions From Hydroelectric Reservoirs	180
<i>Contributors</i>	<i>xi</i>	Gully Erosion	183
Surface Water Hydrology		Potential Health Issues Associated With Blue-Green Algae Blooms in Impoundments, Ponds and Lakes	188
Acidification—Chronic	1	Heat Balance of Open Waterbodies	190
Episodic Acidification	5	Hydraulics	194
Acidification of Freshwater Resources	7	Hydraulics of Pressurized Flow	196
Geochemistry of Acid Mine Drainage	13	Hydroelectric Power	199
The Aral Sea Disaster: Environment Issues and Nationalist Tensions	15	Hydroelectric Reservoirs as Anthropogenic Sources of Greenhouse Gases	203
Lake Baikal—A Touchstone for Global Change and Rift Studies	20	Hydrologic Persistence and The Hurst Phenomenon	210
Base Flow	22	Unit Hydrograph	221
River Basins	28	Hydrological Processes and Measured Pollutant Loads	222
River Basin Planning and Coordination	33	Hydrologic Thresholds	229
Bioaccumulation	34	Ganga River, India	232
Biotic Integrity Index to Evaluate Water Resource Integrity in Freshwater Systems	36	Interception	235
Reversal of the Chicago River	41	Kinematic Shock	239
Flood Control in the Yellow River Basin in China	45	Kinematic Wave Method For Storm Drainage Design	242
Chironomids in Sediment Toxicity Testing	50	Kinematic Wave and Diffusion Wave Theories	246
Cienega	57	Kinematic Wave Flow Routing	253
Time-Area and The Clark Rainfall-Runoff Transformation	60	Reliability Concepts in Reservoir Design	259
Stream Classification	65	Lakes	265
Coastal Wetlands	71	The Theory of Alternative Stable States in Shallow Lake Ecosystems	272
Freshwater Colloids	74	NOAA Lake Level Forecast for Lake Michigan Right on Target	274
Culvert Design	75	Submerged Aquatic Plants Affect Water Quality in Lakes	275
Dilution-Mixing Zones and Design Flows	78	Lakes—Discharges To	281
Drainage Ditches	87	Lasers Scan Levees from the Air	284
Drainage Networks	93	Levees for Flood Protection	286
Dyes As Hydrological Tracers	95	Limnology	291
Flow-duration Curves	102	Adsorption of Metal Ions On Bed Sediments	295
Environmental Flows	106	Microbiology of Lotic Aggregates and Biofilms	305
Eutrophication (Excessive Fertilization)	107	Microorganisms in Their Natural Environment	309
Cultural Eutrophication	114	Calibration of Hydraulic Network Models	313
Fish Cells in the Toxicological Evaluation of Environmental Contaminants	115	Numerical Modeling of Currents	320
Fish Consumption Advisories	118	Uncertainty Analysis in Watershed Modeling	325
Fisheries: History, Science, and Management	121	Watershed Modeling	327
Factors Affecting Fish Growth and Production	129	Modeling of Water Quality in Sewers	331
Water Needs for Freshwater Fisheries Management	133	Modeling of Urban Drainage and Stormwater	337
An Outline of the History of Fishpond Culture in Silesia, the Western Part of Poland	135	Modeling Ungauged Watersheds	342
Floods	142	Corps Turned Niagara Falls Off, On Again	345
Flood Control Structures	150	Open Channel Design	346
Floods as a Natural Hazard	153	Organic Compounds and Trace Elements in Freshwater Streambed Sediment and Fish from the Puget Sound Basin	349
Flood Source Mapping in Watersheds	155	Impervious Cover—Paving Paradise	363
Urban Flooding	159	Phytoremediation By Constructed Wetlands	364
Floodwater Spreading	163	Unrecognized Pollutants	371
Minimum Environmental Flow Regimes	166		
Forensic Hydrogeology	168		
Forests and Wetlands	170		
Rock Glacier	174		
Great Lakes	175		

Pollution of Surface Waters	373	Biofuel Alternatives to Fossil Fuels	545
Pond Aquaculture—Modeling and Decision Support Systems	375	Soil Conservation	549
Pumping Stations	379	Landscape Water-Conservation Techniques	553
Regulated Rivers	381	Crop Water Requirements	557
Reservoirs-Multipurpose	382	Agricultural Water Use Efficiency (WUE) and Productivity (WP)	558
Dam Removal as River Restoration	387	Large Area Surface Energy Balance Estimation Using Satellite Imagery	560
Riparian Systems	390	Soil Erosion and Control Practices	565
Rivers	392	Water Table Contribution to Crop Evapotranspiration	570
River and Water Facts	394	Crop Evapotranspiration	571
Sediment Load Measurements	397	Water Pollution From Fish Farms	579
Sedimentation	401	World's Major Irrigation Areas	581
Sedimentation and Flotation	404	Irrigation in The United States	586
Reservoir Sedimentation	408	Irrigation Wells	594
Water from Saturated River Sediment—Sand Abstraction	412	Agriculture and Land Use Planning	595
Sediment Transport	417	Waterlogging	599
Stochastic Simulation of Hydrosystems	421	Water Quality Management in an Agricultural Landscape	604
Storage and Detention Facilities	430	Classification and Mapping of Agricultural Land for National Water-Quality Assessment	608
Urban Stormwater Runoff Water Quality Issues	432	Metal Tolerance in Plants: The Roles of Thiol-Containing Peptides	609
Rivers and Streams: One-Way Flow System	437	Microirrigation	615
Streamflow	439	Microirrigation: An Approach to Efficient Irrigation	620
Water Quality in Suburban Watersheds	441	Plant and Microorganism Selection for Phytoremediation of Hydrocarbons and Metals	628
Surface Water Pollution	444	Nitrate Pollution Prevention	637
Surface Runoff and Subsurface Drainage	451	Nitrification	640
Trace Elements in Water, Sediment, and Aquatic Biota—Effects of Biology and Human Activity	454	Occurrence of Organochlorine Pesticides in Vegetables Grown on Untreated Soils from an Agricultural Watershed	643
Innovative Pens Hatch Thousands of Trout Watershed	458	Pesticide Chemistry in the Environment	647
Combustible Watersheds	460	Remediation of Pesticide-Contaminated Soil at Agrichemical Facilities	651
Time of Concentration and Travel Time in Watersheds	469	Pesticide Occurrence and Distribution in Relation to Use	655
Watershed Hydrology	472	Assessment of Pollution Outflow From Large Agricultural Areas	657
Watershed Management for Environmental Quality and Food Security	479	Deep-Well Turbine Pumps	664
Water Hyacinth—The World's Most Problematic Weed	479	Microbial Quality of Reclaimed Irrigation: International Perspective	667
Water Quality in Ponds	484	Soil Salinity	673
Water Turbine	487	Maintaining Salt Balance on Irrigated Land	677
Wetlands: Uses, Functions, and Values	489	Salt Tolerance	681
Wetlands Overview	493	Groundwater Assessment Using Soil Sampling Techniques	688
Classification of Wetlands and Deepwater Habitats of the United States	496	Skimmed Groundwater	691
Urban Runoff	498	Soil Moisture Measurement—Neutron	692
Urban Water Studies	501	Soil N Management Impact on The Quality of Surface and Subsurface Water	694
Subglacial Lake Vostok	503	Soil Phosphorus Availability and Its Impact on Surface Water Quality	701
Water—The Canadian Transporter	507	Soil Water Issues	706
Flood Prevention	510	Water Spreading	708
Effects of DDT in Surface Water on Bird Abundance and Reproduction—A History	513	Sprinkler Irrigation	712
Instream Flow Methods	526	Stomates	714
Floodplain	527		
Fish Passage Facilities	529		
Fishing Waters	532		
Land Surface Modeling	533		
Agricultural Water			
Animal Farming Operations: Groundwater Quality Issues	538		
Aquaculture Technology for Producers	540		

Crop Water Stress Detection Using Remote Sensing	719	Water Logging: Topographic and Agricultural Impacts	741
Vacuum Gauge Tensiometer	724	Weed Control Strategies	742
Tile Drainage	729	Screen Filters for Microirrigation	748
Tile Drainage: Impacts, Plant Growth, and Water Table Levels	731	Xeriscape	750
Measuring and Modeling Tree and Stand Level Transpiration	732	Media Filters for Microirrigation	752
		Index	755