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LIST OF ABBREVIATIONS

a_i	=	the amplitude of the i^{th} constitutents
a_0	=	displacement from the reference datum to the mean level
A	=	cross section of river (m^2)
AAE	=	average absolute error
ANNs	=	Artificial Neural Networks
AR	=	auto regressive & updating procedure model
ARMA	=	Autoregressive Moving Average Model
β	=	correction factor
BOD	=	biological oxygen demand
c	=	mass concentration (kg/m^3)
C	=	constant coefficient
CR	=	crossover constant
δ_ι	=	phase of the i^{th} constitutents
D	=	diffusion coefficient (m^2/s)
DE	=	Differential Evolution
DEMO	=	Differential Evolution for Multiobjective
DO	=	dissolved oxygen
DOS	=	dissolved oxygen saturation
ϕ_i	=	model parameter
F	=	weighting factor
FAS	=	fuzzy adaptive systems
FP	=	flood plain model
g	=	gravitational acceleration (m/s^2)
ga	=	the matrix of gate setting
$\overline{g}$ and $\underline{g}$	=	the upper and lower bounds for gate setting, respectively
G	=	the generation to which the population belongs
GA	=	Genetic Algorithm
GOP	=	gate operation model
H	=	water level (m)
HA	=	harmonic analysis model
i	=	index of the population
HD	=	hydrodynamic model
K1	=	decay rate
K2	=	reaeration rate
K3	=	settling removal rate
n	=	Manning's roughness coefficient
$\eta(\tau)$	=	the resultant tidal variation at a particular locality

LIST OF ABBREVIATIONS (continued)

N	=	the number of harmonic constituent
N_d	=	number of data
NB	=	node-branch model
NGO	=	NeuroGenetic Optimizer
NP	=	population size
P	=	population
PDE	=	Pareto Differential Evolution algorithm
q	=	lateral discharge (m^3/s)
Q	=	discharge (m^3/s)
$\hat{Q}_{t+1}$	=	measured discharge at previous time (t+1)
$Q_{sim,t+1}$	=	discharge simulated by Tank model at time t+1
R	=	hydraulic radius (m)
R^2	=	correlation coefficient
$R_{di,j}$	=	relative importance of interesting parameter j in water subsystem i within a particular area
$rand_j[0,1]$	=	uniformly distributed random value within range [0.0,1.0]
Randb(j)	=	the j^{th} evaluation of a uniform random number generator with outcome Î [0,1]
Rnbr(i)	=	a randomly chosen index $\in$ 1,2,3,..,D
RC	=	rating curve model
RID	=	Royal Irrigation Department
ROM	=	River Operation model
RTC	=	real-time control
S	=	source/sing term (kg/m/s)
$S_{i,j}\left(\overline{x},\overline{u}\right)$	=	satisfaction function j for water subsystem i
SOD	=	sediment oxygen demand
SOM	=	Self Organizing Map
STR	=	structural model
t	=	time (s)
T_i	=	period of the i^{th} constitutents
u	=	flow velocity (m/s)
$\overline{u}$	=	time-dependent control variables
$U_{i,G+1}$	=	the trial vector
$V_{i,G+1}$	=	the mutant vectors
VEDE	=	Vector Evaluated Differential Evolution
w	=	the weight vector

LIST OF ABBREVIATIONS (continued)

W_{ai}	=	weighting factor for an area in the objective function
WD	=	water demand model
WQ	=	water quality model
wq	=	water quality parameters
x	=	distance (m)
$\overline{x}$	=	time-dependent state variables
$x^{(L)}$ and $x^{(U)}$	=	lower and upper boundary constraints, respectively
$X_{i,G}$	=	the target vector
$X_{r1,G}$, $X_{r2,G}$ and $X_{r3,G}$	=	three random individuals chosen in the current generation
$x_{calculated}$	=	state variables obtained from calculation of simulation model
$x_{desired}$	=	desired state variables
$\overline{x}$	=	state variables
x_u	=	upper limits on state variables
x_l	=	lower limits on state variables
$Y_{desired}$	=	desired output
$Y_{predicted}$	=	predicted output
Z	=	objective function
$\hat{Z}_{t+1}$	=	model error at time t+1
$\{Z_t\}$	=	sequence of observed model error