LIST OF SYMBOLS AND ABREVIATIONS

θ = soil water content

λ = dispersivity

A_{adj} = adjunct impervious area

A_{dam} = dam area

A_{dis} = disjunct impervious area

A_{gls} = gross net land segment area

A_{irrig} = irrigated land area

A_s = the surface area at various storage volumes of the reservoir

BF = volume of baseflow release for the day

BTC = break-through curves

C = solute concentration

C_{bf} = baseflow salt concentration

C_{chnl} = TDS concentration of flow at the channel reach

CDE = convection-dispersion equation

C_{dsf} = salt concentration of delayed stormflow

C_e = solute equilibrium

C_{gw} = salt concentration of the groundwater store before salt generation

C_i = salt concentration of the i-th horizon before salt generation or reservoir salinity at the end of the current day of simulation

C_{i-1} = reservoir salinity at the end of the previous day

C_{in} = TDS concentration in water infiltrating to a particular layer

Cin_i = average salt concentration of reservoir inflowing water on the current day of simulation

C_{iw} = irrigation water salinity

C_{nf} = salt concentration of normal (legal) flow release

C_{of} = salt concentration of overflow

C_{qf} = quickflow salinity

C_r = rainfall salinity

C_{run} = salt concentration of runoff water

C_{run_adj} = salt concentration of runoff from adjunct impervious areas

C_{run_imp} = salt concentration of runoff water from impervious areas

C_{run_irr} = salt concentration of runoff water from irrigated areas

C_{run_ni} = Salt concentration of runoff from non-irrigated lands

C_{sat} = the equilibrium value

C_{seep} = salt concentration of seepage water

C_{sf} = stormflow salinity

CSIR = council for scientific research

C_{upd_gw} = updated groundwater salinity (after salt generation)

C_{upd_i} = updated horizon salinity (after salt generation)

D_* = coefficient of molecular or ionic diffusion for the liquid phase of the soil

D_{dis} = coefficient of mechanical dispersion

D_o = coefficient of molecular diffusion for a free or bulk solution

DUL = drained upper limit

DWAF = department of water affairs and forestry

EC = electrical conductivity

ECe = soil salinity

ECw = electrical conductivity of applied irrigation water

ER = volume of effective rainfall

Fc_i = drained upper limit of the i-th layer

f_{dam} = fraction of the gross catchment area contributing its flow to the dam

GW = volumetric groundwater content after baseflow release

Ia = initial abstractions before stormflow commences

I_{dam} = total water inflow to the dam on the day including rain falling on surface of the dam

IW = volume of irrigation water

IWR = institute for water research

Jc = convective flux of solute

J_{dif} = solute flux due to molecular diffusion

J_{dis} = dispersive solute flux

Js = total solute flux due to the joint effects of diffusion and convection

k = salt uptake rate constant

L = straight length of the soil

L_* = actual path length for diffusion in the soil

LAI = leaf area index

LF = fraction of applied volume of water leached below the root zone

$LNLSA\_i$ = lower net land segment area under the i-th sub-catchment configuration

MAP = mean annual precipitation

NF_{dam} = legal flow release volume

$NLSA$ = total area of the non-irrigated land in a sub-catchment

OF_{dam} = dam overflow volume

Pg = gross daily precipitation amount

PW_i = volume of percolated water out of the i-th horizon

Q = discharge

q = rate of volumetric water flow

Q_a = local concentration of solute in the adsorbed phase

QF = quickflow volume

QF = total quickflow volume

QF_a = actual quickflow, i.e. fraction of the total stormflow leaving the land on the same day

Qin_i = water inflow to the reservoir on the current day of simulation

$Qout_i$ = water outflow from the reservoir for the current day of simulation (excluding evaporation loss)

R = volumetric ratio of "new" to "old" water

RFL_{dam} = volume of rain falling on the dam surface

RUN = the total runoff volume from non-irrigated land in a sub-catchment

RUN_{adj} = runoff volume from the adjunct impervious areas

RUN_{adj_dam} = runoff from adjunct impervious areas inflowing to the dam

RUN_{chnl} = runoff volume inflowing to the channel

RUN_{dam} = runoff volume entering to the dam

RUN_{dis} = runoff volume from disjunct impervious area

RUN_{imp} = depth of runoff from impervious area

RUN_{irr} = runoff from irrigated areas

RUN_{ni} = runoff flowing into the dam from non-irrigated lands

S = solute loss (sink) or gain (source)

$SEEP_{dam}$ = volume of seepage water from the dam

SF_d = fraction of delayed stormflow contributing to quickflow

$Sgen$ = total daily salt mass generated per soil layer

S_i = volume of water stored in the reservoir at the current day of simulation

S_{i-1} = volume of water stored in the reservoir at the end of the previous day

SL = total salt load associated with runoff from the non-irrigated land

SL_{adj_chnl} = salt load flowing into the channel from adjunct impervious areas

SL_{adj_dam} = the salt load flowing into the dam from adjunct impervious areas

SL_{aiw} = salt load input to topsoil associated with irrigation water

SL_{bf} = salt load associated with baseflow release

SL_{chnl} = salt load entering to the channel

SL_{dam} = salt load inflowing to the dam

SL_{dam_of} = total salt load released from the dam to downstream reaches

SL_{dis} = salt load associated with runoff from disjunct impervious areas

SL_{er} = salt load input to topsoil associated with rainfall

SL_{gen_gw} = salt load generated for the day in groundwater store

SL_{gen_i} = salt load generated for the day in the i-th soil horizon

SL_{gw} = groundwater store salt load before salt generation

SL_i = current salt load of the i-th horizon before salt generation

SL_{inf_t} = daily total salt load stored in the channel reach

SL_{p_i} = the salt load associated with the percolation water out of the i-th horizon

SL_{qf} = salt load associated with the total quickflow volume for the day

SL_{run} = the salt load associated with runoff water

SL_{upd_gw} = salt load of groundwater store after salt generation

SL_{upd_i} = salt load in the i-th horizon after salt generation

SL_{upf} = upward salt flux from topsoil to quickflow

$SMCs$ = soil moisture content

SP_i = saturation water content

$STFL$ = volume of streamflow at the channel reach

Sv = storage (volume) of water

SW_i = volumetric soil water content of the i-th horizon after percolation has taken place out of the horizon

TDS = total dissolved solutes

UML = unified modelling language

$UNLSA\_i$ = upper net land segment area under the i-th sub-catchment configuration

V = average flow velocity

x = distance

$X(LF)$ = concentration factor