Waqtel Reference Manual

Otto Mattic

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1. Detail list of keywords

1.1 AIR SPECIFIC HEAT

Type: Real
Dimension: 0
Mnemo CP_AIR
DEFAULT VALUE: 1005.

French keyword: CHALEUR SPECIFIQUE DE L'AIR

in J/KGcircC

1.2 ALGAL TOXICITY COEFFICIENTS

Type: Real Dimension: 2

Mnemo CTOXIC DEFAULT VALUE: 1.;0.

French keyword: COEFFICIENTS DE TOXICITE POUR LES ALGUES

ALPHA1 AND ALPHA2

1.3 ATMOSPHERE-WATER EXCHANGE MODEL

Type: Integer Dimension: 0

Mnemo ATMOSEXCH

DEFAULT VALUE: 0

French keyword: MODELE D'ECHANGES EAU-ATMOSPHERE

Choice of the atmosphere-water exchange model.

1.4 BENTHIC DEMAND

Type: Real Dimension: 0

Mnemo DEMBEN

DEFAULT VALUE: 0.1

French keyword: DEMANDE BENTHIQUE

IN gO2/m2/J

1.5 BOUNDARY CONDITIONS FILE

Type: String Dimension: -1

Mnemo WAQ_FILES(WAQCLI)

DEFAULT VALUE: '

French keyword: FICHIER DES CONDITIONS AUX LIMITES

Name of the file containing the types of boundary conditions. This file is filled automatically by the mesh generator through through colours that are assigned to the boundary nodes.

1.6 COEFFICIENT OF CLOUDING RATE

Type: Real Dimension: 1

Mnemo COEF_K DEFAULT VALUE: 0.2

French keyword: COEFFICIENT REPRESENTATIF DE LA COUVERTURE NUAGEUSE

TODO: WRITE HELP FOR THAT KEYWORD

1.7 COEFFICIENT OF DISTRIBUTION

Type: Real Dimension: 0

Mnemo CDISTRIB DEFAULT VALUE: 1775.

French keyword: COEFFICIENT DE DISTRIBUTION

in M3/KG or 1/g

1.8 COEFFICIENT TO CALIBRATE THE ATMOSPHERE-WATER EXCHANGE MODEL

Type: Real Dimension: 0

Mnemo C_ATMOS DEFAULT VALUE: 0.0025

French keyword: COEFFICIENT DE CALAGE DU MODELE D'ECHANGES EAU-ATMOSPHERE

Value of the calibration coefficient for the wind function of the atmosphere-water exchange models (linearised formula at the free surface or complete balance). A value between 0.0017 and 0.0035 is advised

1.9 COEFFICIENTS A AND B FOR RS FORMULA

Type: Real
Dimension: 2
Mnemo ABRS
DEFAULT VALUE: 1.2;0.7

French keyword: COEFFICIENTS A ET B POUR LA FORMULE DE RS

COEFFICIENTS NEEDED FOR THE CALUCLATION OF RS A IS BETWEEN 0.65(VERY

POLLUTED WATER AND 1.8 (VERY CLEAR WATER))

1.10 COEFFICIENTS FOR CALIBRATING ATMOSPHERIC RADIATION

Type: Real
Dimension: 1
Mnemo EMA
DEFAULT VALUE: 0.97

French keyword: COEFFICIENTS DE CALAGE DU RAYONNEMENT ATMOSPHERIQUE

TODO: WRITE HELP FOR THAT KEYWORD

1.11 COEFFICIENTS FOR CALIBRATING SURFACE WATER RADIATION

Type: Real Dimension: 1

Mnemo EMI_EAU DEFAULT VALUE: 0.97

French keyword: COEFFICIENTS DE CALAGE DU RAYONNEMENT DU PLAN D'EAU

TODO: WRITE HELP FOR THAT KEYWORD

1.12 COEFFICIENTS OF AERATION FORMULA

Type: Real
Dimension: 2
Mnemo CFAER
DEFAULT VALUE: 0.002;0.0012

French keyword: COEFFICIENTS DE LA FORMULE D'AERATION

TODO: WRITE HELP FOR THAT KEYWORD

1.13 COEFFICIENTS OF ALGAL MORTALITY AT 20C

Type: Real Dimension: 2

Mnemo CMORALG DEFAULT VALUE: 0.1;0.003

French keyword: COEFFICIENTS DE MORTALITE ALGALE A 20C

TODO: WRITE HELP FOR THAT KEYWORD

1.14 CONSTANT FOR THE NITRIFICATION KINETIC K520

Type: Real
Dimension: 0
Mnemo K520
DEFAULT VALUE: 0.35

French keyword: CONSTANTE DE LA CINETIQUE DE NITRIFICATION K520

IN J-1

1.15 CONSTANT OF DEGRADATION OF ORGANIC LOAD K1

Type: Real
Dimension: 0
Mnemo K1
DEFAULT VALUE: 0.25

French keyword: CONSTANTE DE DEGRADATION DE LA CHARGE ORGANIQUE K1

in J-1

1.16 CONSTANT OF DEGRADATION OF ORGANIC LOAD K120

Type: Real
Dimension: 0
Mnemo K120
DEFAULT VALUE: 0.35

French keyword: CONSTANTE DE DEGRADATION DE LA CHARGE ORGANIQUE K120

in J-1

1.17 CONSTANT OF DESORPTION KINETIC

Type: Real Dimension: 0

Mnemo KDESORP DEFAULT VALUE: 2.5E-7

French keyword: CONSTANTE CINETIQUE DE DESORPTION

in S-1

1.18 CONSTANT OF HALF-SATURATION WITH NITROGEN

Type: Real
Dimension: 0
Mnemo KN
DEFAULT VALUE: 0.03

French keyword: CONSTANTE DE DEMI-SATURATION EN AZOTE

in mgN/l

1.19 CONSTANT OF HALF-SATURATION WITH PHOSPHATE

Type: Real
Dimension: 0
Mnemo KP
DEFAULT VALUE: 0.005

French keyword: CONSTANTE DE DEMI-SATURATION EN PHOSPHATE

IN mgP/l

1.20 CONSTANT OF NITRIFICATION KINETIC K4

Type: Real
Dimension: 0
Mnemo K44
DEFAULT VALUE: 0.35

French keyword: CONSTANTE DE CINETIQUE DE NITRIFICATION K4

in J-1

1.21 CONSUMED OXYGEN BY NITRIFICATION

Type: Real Dimension: 0

Mnemo O2NITRI DEFAULT VALUE: 5.2

French keyword: OXYGENE CONSOMME PAR NITRIFICATION

IN MgO2/MgNH4

1.22 CRITICAL STRESS OF RESUSPENSION

Type: Real
Dimension: 0
Mnemo TAUR
DEFAULT VALUE: 1000.

French keyword: CONTRAINTE CRITIQUE DE REMISE EN SUSPENSION

in PA

1.23 DEBUGGER

Type: Integer
Dimension: 0
Mnemo DEBUG
DEFAULT VALUE: 0

French keyword: DEBUGGER

If 1, calls of subroutines will be printed in the listing

1.24 DEFAULT EXECUTABLE

Type: String Dimension: 1

Mnemo EXEDEF

DEFAULT VALUE: 'builds|PPP|bin|waqte|MMMVVV.exe'
French keyword: EXECUTABLE PAR DEFAUT

Default executable for WAQ

1.25 DEFAULT PARALLEL EXECUTABLE

Type: String Dimension: 1

Mnemo EXEDEFPARA

DEFAULT VALUE: 'builds|PPP|bin|waqte|MMMVVV.exe'

French keyword: EXECUTABLE PARALLELE PAR DEFAUT

Default parallel executable for WAQ

1.26 DESCRIPTION OF LIBRARIES

Type: String Dimension: 5

Mnemo LINKLIBS

 $DEFAULT\ VALUE: \quad `builds|PPP|lib|biefMMMVVV.LLL;$

builds|PPP|lib|damoMMMVVV.LLL; builds|PPP|lib|hermesMMMVVV.LLL; builds|PPP|lib|parallelMMMVVV.LLL; builds|PPP|lib|specialMMMVVV.LLL'

French keyword: DESCRIPTION DES LIBRAIRIES

LIBRARIES description

1.27 DICTIONARY

Type: String Dimension: -1

Mnemo

DEFAULT VALUE: 'waqtel.dico'
French keyword: DICTIONNAIRE

Key word dictionary.

1.28 DISPERSION ACROSS THE FLOW

Type: Real
Dimension: 0
Mnemo TDISP
DEFAULT VALUE: 1.E-2

French keyword: DISPERSION TRANSVERSALE

TODO: WRITE HELP FOR THAT KEYWORD

1.29 DISPERSION ALONG THE FLOW

Type: Real
Dimension: 0
Mnemo LDISP
DEFAULT VALUE: 1.E-2

French keyword: DISPERSION LONGITUDINALE

TODO: WRITE HELP FOR THAT KEYWORD

1.30 EROSION RATE

Type: Real Dimension: 0 Mnemo ERO DEFAULT VALUE: 0.

French keyword: TAUX D'EROSION TODO: WRITE HELP FOR THAT KEYWORD

1.31 EVAPORATION RATE

Type: Real Dimension: 0

Mnemo EVAPORATION

DEFAULT VALUE: 0.

French keyword: TAUX D'EVAPORATION rate of evaporation - same unit as rainfall in m3/s/m2

1.32 EXPONENETIAL DESINTEGRATION CONSTANT

Type: Real Dimension: 0

Mnemo CCSEDIM DEFAULT VALUE: 1.13E-7

French keyword: CONSTANTE DE DESINTEGRATION EXPONENETIELLE

in S-1, exponential decrease law like the one of radioactivity

1.33 FORMULA FOR COMPUTING CS

Type: Integer Dimension: 0

Mnemo FORMCS

DEFAULT VALUE: 0

French keyword: FORMULE DE CALCUL DE CS

IN J-1, HERE ARE AVAILABLE OPTIONS 0: CONSTANT 1: ELMORE & HAYES FOR-

MULA 2: MONTGOMERY FORMULA

1.34 FORMULA FOR COMPUTING K2

Type: Integer Dimension: 0

Mnemo FORMK2

DEFAULT VALUE: 1

French keyword: FORMULE DE CALCUL DE K2

GIVES HOW TO CUMPUTE THE REAERATION COEFFICIENT K2 OPTIONS ARE: 0-K2 CONSTANT, IN THIS CASE K2=0.9 1- FORMULA OF THE TENESSEE VALLEY AUTHORITY 2- FORMULA OF OWENS ET AL. 3- FORMULA OF CHURCHILL ET AL. 4-FORMULA OF O CONNOR & DOBBINS 5- FORMULA OF ??

1.35 FORMULA FOR COMPUTING RS

Type: Integer Dimension: 0

Mnemo FORMRS

DEFAULT VALUE: 0

French keyword: FORMULE DE CALCUL DE RS

GIVES HOW TO CUMPUTE THE WEIR REAERATION COEFFICIENT RS OPTIONS ARE: 0- RS CONSTANT, IN THIS CASE RS=1.0 1- FORMULA OF GAMESON 1 2- FORMULA OF GAMESON 2 3- FORMULA OF WRL 1 4- FORMULA OF WRL 2

1.36 FORMULA OF ATMOSPHERIC RADIATION

Type: Integer Dimension: 1

Mnemo IRAY ATM

DEFAULT VALUE: 2

French keyword: FORMULE DU RAYONNEMENT ATMOSPHERIQUE

Formula to be chosen to compute the atmospheric radiation. See GLM.

1.37 FORTRAN FILE

Type: String Dimension: -1

Mnemo NOMFOR DEFAULT VALUE: 'DEFAUT'

French keyword: FICHIER FORTRAN Name of FORTRAN file to be submitted.

1.38 GEOMETRY FILE

Type: String Dimension: 0

Mnemo WAQ_FILES(WAQGEO)

DEFAULT VALUE:

French keyword: FICHIER DE GEOMETRIE

geometry file same as the telemac2d one

1.39 GEOMETRY FILE FORMAT

Type: String Dimension: -1

Mnemo WAQ_FILES(WAQGEO)

DEFAULT VALUE: 'SERAFIN'

French keyword: FORMAT DU FICHIER DE GEOMETRIE

geometry file format. Possible values are: - SERAFIN: classical single precision format in Telemac; - SERAFIND: classical double precision format in Telemac; - MED: MED format

based on HDF5

1.40 HYDRODYNAMIC FILE

Type: String Dimension: 0

Mnemo WAQ_FILES(WAQHYD)

DEFAULT VALUE:

French keyword: FICHIER HYDRODYNAMIQUE

hydrodynamic data file coming from telemac2d

1.41 HYDRODYNAMIC FILE FORMAT

Type: String Dimension: -1

Mnemo WAQ_FILES(WAQHYD)

DEFAULT VALUE: 'SERAFIN'

French keyword: FORMAT DU FICHIER HYDRODYNAMIOUE

hydrodynamic file format. Possible values are: - SERAFIN: classical single precision format in Telemac; - SERAFIND: classical double precision format in Telemac; - MED: MED format

based on HDF5

1.42 K2 REAERATION COEFFICIENT

Type: Real
Dimension: 0
Mnemo K22
DEFAULT VALUE: 0.9

French keyword: COEFFICIENT DE REAERATION K2

IN J-1

1.43 KINEMATIC WATER VISCOSITY

Type: Real
Dimension: -1
Mnemo VCE
DEFAULT VALUE: 1.E-6

French keyword: VISCOSITE CINEMATIQUE EAU

Specifies the water kinematic viscosity. M/S2

1.44 LIGHTNESS OF THE SKY

Type: Integer Dimension: 1

Mnemo ISKYTYPE

DEFAULT VALUE: 2

French keyword: CLARTE DU CIEL

how the sky is bright (pure).

1.45 LIST OF FILES

Type: String Dimension: 7

Mnemo

DEFAULT VALUE: 'STEERING FILE;

RESULTS FILE; GEOMETRY FILE;

BOUNDARY CONDITIONS FILE; FICHIER HYDRODYNAMIQUE;

REFERENCE FILE; DICTIONARY'

French keyword: LISTE DES FICHIERS

File names of the used files

1.46 MASS-BALANCE

Type: Logical Dimension: -1

Mnemo WQBILMAS

DEFAULT VALUE: NO

French keyword: BILAN DE MASSE

Determines whether a check of the mass-balance over the domain is made or not

1.47 MAXIMUM ALGAL GROWTH RATE AT 20C

Type: Real
Dimension: 1
Mnemo CMAX
DEFAULT VALUE: 2.

French keyword: TAUX DE CROISSANCE ALGALE MAXIMUM A 20C

MAXIMUM ALGAL GROWTH RATE AT 20C

1.48 METHOD OF COMPUTATION OF RAY EXCTINCTION COEFFICIENT

Type: Integer Dimension: -1

Mnemo MEXTINC

DEFAULT VALUE: 1

French keyword: METHODE DE CALCUL DU COEFFICIENT D'EXTINCTION DU RAY

choice of the method of calculation of the extinction of sun ray - the choices are: 1- Atkins

formula 2- Moss formula

1.49 O2 SATURATION DENSITY OF WATER (CS)

Type: Real Dimension: 0

Mnemo O2SATU DEFAULT VALUE: 11.

French keyword: CONCENTRATION DE SATURATION EN 02 DE L'EAU (CS)

IN Mg/l

1.50 OXYGENE PRODUCED BY PHOTOSYNTHESIS

Type: Real Dimension: 0

Mnemo O2PHOTO DEFAULT VALUE: 0.15

French keyword: OXYGENE PRODUIT PAR PHOTOSYNTHESE

IN MgO2/MicroGChLA

1.51 PARAMETER OF CALIBRATION OF SMITH FORMULA

Type: Real
Dimension: 0
Mnemo IK
DEFAULT VALUE: 120.

French keyword: PARAMETRE DE CALAGE DE LA FORMULE DE SMITH

IN W/m2

1.52 PERCENTAGE OF NITROGEN ASSIMILABLE IN DEAD PHYTO

Type: Real Dimension: 0

Mnemo PERNITS
DEFAULT VALUE: 0.5

French keyword: PERCENTAGE D'AZOTE ASSIMILABLE DANS LE PHYTO MORT

IN PERCENTAGE

1.53 PERCENTAGE OF PHYSPHORUS ASSIMILABLE IN DEAD PHYTO

Type: Real
Dimension: 0
Mnemo DTP
DEFAULT VALUE: 0.5

French keyword: POURCENTAGE DE PHOSPHORE ASSIMILABLE DANS LE PHYTO MORT

IN PERCENTAGE

1.54 PHOTOSYNTHESIS P

Type: Real
Dimension: 0
Mnemo PHOTO

DEFAULT VALUE: 1.

French keyword: PHOTOSYNTHESE P

in mgO2/J:1

1.55 PROPORTION OF NITROGEN WITHIN PHYTO CELLS

Type: Real Dimension: 0

Mnemo PRONITC
DEFAULT VALUE: 0.0035

French keyword: PROPORTION D'AZOTE DANS LES CELLULES DU PHYTO

IN Mgp/microgchla

1.56 PROPORTION OF PHOSPHORUS WITHIN PHYTO CELLS

Type: Real Dimension: 0

Mnemo PROPHOC DEFAULT VALUE: 0.0025

French keyword: PROPORTION DE PHOSPHORE DANS LES CELLULES DU PHYTO

IN Mgp/microgchla

1.57 RATE OF TRANSFORMATION OF NOR TO NO3

Type: Real
Dimension: 0
Mnemo K360
DEFAULT VALUE: 0.

French keyword: TAUX DE TRANSFORMATION DU NOR EN NO3

RATE OF TRANSFOMATION OF NOR TO NO3 BY BACTERIA MINERALIZATION IN

J-1

1.58 RATE OF TRANSFORMATION OF POR TO PO4

Type: Real
Dimension: 0
Mnemo K320
DEFAULT VALUE: 0.03

French keyword: TAUX DE TRANSFORMATION DU POR EN PO4

IN J-1

1.59 REFERENCE FILE

Type: String Dimension: 0

Mnemo WAQ_FILES(WAQREF)

DEFAULT VALUE:

French keyword: FICHIER DE REFERENCE

Name of the file used to validate the computation. If VALIDATION = YES, the results of the computation will be compared with the values of this file. The comparison is made by the subroutine BIEF VALIDA. (not implemented yet)

1.60 REFERENCE FILE FORMAT

Type: String Dimension: -1

Mnemo WAQ_FILES(WAQREF)

DEFAULT VALUE: 'SERAFIN'

French keyword: FORMAT DU FICHIER DE REFERENCE

hydrodynamic file format. Possible values are: - SERAFIN: classical single precision format in Telemac; - SERAFIND: classical double precision format in Telemac; - MED: MED format based on HDF5

1.61 RELEASE

Type: String Dimension: -1

Mnemo

DEFAULT VALUE: 'V7P2'

French keyword: NUMERO DE VERSION

Release of the libraries used by WAQTEL.

1.62 RESPIRATION RATE OF ALGAL BIOMASS

Type: Real Dimension: 0

Mnemo TRESPIR DEFAULT VALUE: 0.05

French keyword: TAUX DE RESPIRATION DE LA BIOMASSE ALGALE

IN J-1, FOR 20 c

1.63 RESULTS FILE

Type: String Dimension: 0

Mnemo WAQ_FILES(WAQRES)

DEFAULT VALUE: '

French keyword: FICHIER DES RESULTATS

Name of the file into wich the computation results shall be written, the periodicity being given by the keyword WAQ PRINTOUT PERIOD.

1.64 RESULTS FILE FORMAT

Type: String Dimension: -1

Mnemo WAQ_FILES(WAQRES)

DEFAULT VALUE: 'SERAFIN'

French keyword: FORMAT DU FICHIER DES RESULTATS

results file format. Possible values are: - SERAFIN: classical single precision format in Telemac; - SERAFIND: classical double precision format in Telemac; - MED: MED format

based on HDF5

1.65 SECCHI DEPTH

Type: Real
Dimension: 1
Mnemo ZSD
DEFAULT VALUE: 0.

French keyword: PROFONDEUR DE SECCHI

IN M

1.66 SEDIMENT SETTLING VELOCITY

Type: Real Dimension: 0

Mnemo VITCHU DEFAULT VALUE: 6.E-6

French keyword: VITESSE DE CHUTE DES MES

in M/S

1.67 SEDIMENTATION CRITICAL STRESS

Type: Real
Dimension: 0
Mnemo TAUS
DEFAULT VALUE: 5.

French keyword: CONTRAINTE CRITIQUE DE SEDIMENTATION

in PA

1.68 SEDIMENTATION VELOCITY OF NON ALGAL NITROGEN

Type: Real
Dimension: 0
Mnemo WNOR
DEFAULT VALUE: 0.

French keyword: VITESSE DE SEDIMENTATION DE L'AZOTE NON ALGALE

IN M/S

1.69 SEDIMENTATION VELOCITY OF ORGANIC LOAD

Type: Real
Dimension: 0
Mnemo WLOR
DEFAULT VALUE: 0.

French keyword: VITESSE DE SEDIMENTATION DE LA CHARGE ORGANIQUE

IN M/S

1.70 SEDIMENTATION VELOCITY OF ORGANIC PHOSPHORUS

Type: Real
Dimension: 0
Mnemo WPOR
DEFAULT VALUE: 0.

French keyword: VITESSE DE SEDIMENTATION DU PHOSPHORE ORGANIQUE

IN M/S

1.71 STEERING FILE

Type: String Dimension: -1

Mnemo

DEFAULT VALUE: '

French keyword: FICHIER DES PARAMETRES

Name of the file containing parameters of the WAQ computation Written by the user.

1.72 SUNSHINE FLUX DENSITY ON WATER SURFACE

Type: Real Dimension: 1 Mnemo IO DEFAULT VALUE: 0.

French keyword: DENSITE DE FLUX DU RAYONNEMENT SOLAIRE A LA SURFACE

DENSITY OF SUNSHINE FLUX ON THE WATER SURFACE IN W/m2

1.73 VALIDATION

Type: Logical Dimension: -1

Mnemo WQVALID

DEFAULT VALUE: NO

French keyword: VALIDATION

This option is primarily used for the validation documents. If this keyword is equal to YES, the REFERENCE FILE is then considered as a reference which the computation is going to be compared with.

1.74 VARIABLES FOR WAQ PRINTOUTS

Type: String Dimension: -1

Mnemo

DEFAULT VALUE: "

French keyword: VARIABLES POUR LES SORTIES QE Names of variables the user wants to write into the graphic results file.

1.75 VEGERAL RESPIRATION R

Type: Real
Dimension: 0
Mnemo RESP
DEFAULT VALUE: 0.06

French keyword: RESPIRATION VEGETALE R

in mgO2/J/l

1.76 VEGETAL TURBIDITY COEFFICIENT WITHOUT PHYTO

Type: Real
Dimension: 0
Mnemo KPE
DEFAULT VALUE: 0.

French keyword: COEFFICIENT DE TURBIDITE VEGETALE SANS PHYTO COEFFICIENT OF VEGATAL TURBIDITY WITHOUT PHYTOPLANKTON - in m-1

1.77 WAQ CASE TITLE

Type: String Dimension: -1

Mnemo TITWAQCAS

DEFAULT VALUE: '

French keyword: TITRE DU CAS QE

Title of the case being considered. This title shall be marked on the printouts.

1.78 WAQ VARIABLES TO BE PRINTED

Type: String
Dimension: -1

Mnemo

DEFAULT VALUE: '

French keyword: VARIABLES QE A IMPRIMER

Names of variables the user wants to write on the listing. Each variable is represented by a letter in the same manner as it is done in the graphic results file.

1.79 WATER DENSITY

Type: Real
Dimension: -1
Mnemo RO0
DEFAULT VALUE: 999.972

French keyword: MASSE VOLUMIQUE DE L'EAU

sets the value of water density.

1.80 WATER QUALITY PRINTOUT PERIOD

Type: Integer Dimension: -1

Mnemo LEOPRD

DEFAULT VALUE: 1

French keyword: PERIODE POUR LES SORTIES QUALITE D'EAU

graphic outputs period for waq

1.81 WATER SPECIFIC HEAT

Type: Real Dimension: 0

Mnemo CP_EAU DEFAULT VALUE: 4180.

French keyword: CHALEUR SPECIFIQUE DE L'EAU

in J/KGcircC

1.82 WATER TEMPERATURE

Type: Real Dimension: 0

Mnemo WATTEMP

DEFAULT VALUE: 7.

French keyword: TEMPERATURE DE L'EAU

in circ C, MEAN TEMPERATURE NECESARY FOR COMPUTING DIFFERENT VALUES

OF CS

1.83 WEIR REAERATION COEFFICIENT RS

Type: Real
Dimension: 0
Mnemo RSW
DEFAULT VALUE: 1.0

French keyword: COEFFICIENT DE REAERATION DU SEUIL RS

IN J-1

2. List of keywords classified according to type

2.1 BIOMASS

RATE OF TRANSFORMATION OF NOR TO NO3 SUNSHINE FLUX DENSITY ON WATER SURFACE

2.2 BIOMASS,WQ

METHOD OF COMPUTATION OF RAY EXCTINCTION COEFFICIENT

2.3 COMPUTATION ENVIRONMENT

DICTIONARY

2.4 COMPUTATIONAL INFORMATION

DEFAULT EXECUTABLE
DEFAULT PARALLEL EXECUTABLE
DESCRIPTION OF LIBRARIES
RELEASE
WAO CASE TITLE

2.5 DATA FILES

GEOMETRY FILE HYDRODYNAMIC FILE REFERENCE FILE

2.6 EUTROPHICATION

AIR SPECIFIC HEAT
ALGAL TOXICITY COEFFICIENTS

BENTHIC DEMAND

COEFFICIENT OF CLOUDING RATE

COEFFICIENT OF DISTRIBUTION

COEFFICIENTS FOR CALIBRATING ATMOSPHERIC RADIATION

COEFFICIENTS FOR CALIBRATING SURFACE WATER RADIATION

COEFFICIENTS OF AERATION FORMULA

COEFFICIENTS OF ALGAL MORTALITY AT 20C

CONSTANT FOR THE NITRIFICATION KINETIC K520

CONSTANT OF DEGRADATION OF ORGANIC LOAD K1

CONSTANT OF DEGRADATION OF ORGANIC LOAD K120

CONSTANT OF DESORPTION KINETIC

CONSTANT OF HALF-SATURATION WITH NITROGEN

CONSTANT OF HALF-SATURATION WITH PHOSPHATE

CONSTANT OF NITRIFICATION KINETIC K4

CONSUMED OXYGEN BY NITRIFICATION

CRITICAL STRESS OF RESUSPENSION

EROSION RATE

EXPONENETIAL DESINTEGRATION CONSTANT

FORMULA FOR COMPUTING CS

FORMULA FOR COMPUTING K2

K2 REAERATION COEFFICIENT

MAXIMUM ALGAL GROWTH RATE AT 20C

O2 SATURATION DENSITY OF WATER (CS)

OXYGENE PRODUCED BY PHOTOSYNTHESIS

PARAMETER OF CALIBRATION OF SMITH FORMULA

PERCENTAGE OF NITROGEN ASSIMILABLE IN DEAD PHYTO

PERCENTAGE OF PHYSPHORUS ASSIMILABLE IN DEAD PHYTO

PHOTOSYNTHESIS P

PROPORTION OF NITROGEN WITHIN PHYTO CELLS

PROPORTION OF PHOSPHORUS WITHIN PHYTO CELLS

RATE OF TRANSFORMATION OF POR TO PO4

RESPIRATION RATE OF ALGAL BIOMASS

SECCHI DEPTH

SEDIMENT SETTLING VELOCITY

SEDIMENTATION CRITICAL STRESS

SEDIMENTATION VELOCITY OF NON ALGAL NITROGEN

SEDIMENTATION VELOCITY OF ORGANIC LOAD

SEDIMENTATION VELOCITY OF ORGANIC PHOSPHORUS

VEGERAL RESPIRATION R

VEGETAL TURBIDITY COEFFICIENT WITHOUT PHYTO

WATER SPECIFIC HEAT

WATER TEMPERATURE

2.7 FILES

LIST OF FILES

2.8 IN-OUT,WQ 25

2.8 IN-OUT, WQ

WATER QUALITY PRINTOUT PERIOD

2.9 INPUT-OUTPUT, FILES

BOUNDARY CONDITIONS FILE FORTRAN FILE GEOMETRY FILE FORMAT HYDRODYNAMIC FILE FORMAT REFERENCE FILE FORMAT RESULTS FILE FORMAT STEERING FILE

2.10 INPUT-OUTPUT, GRAPHICS AND LISTING

VARIABLES FOR WAQ PRINTOUTS

2.11 INPUT-OUTPUT, INFORMATION

DEFAULT EXECUTABLE
DEFAULT PARALLEL EXECUTABLE
DESCRIPTION OF LIBRARIES
DICTIONARY
RELEASE
WAO CASE TITLE

2.12 MISCELLANEOUS

DEBUGGER VALIDATION

2.13 NAMES

BOUNDARY CONDITIONS FILE FORTRAN FILE STEERING FILE

2.14 PHYSICAL PARAMETERS

ATMOSPHERE-WATER EXCHANGE MODEL
COEFFICIENT TO CALIBRATE THE ATMOSPHERE-WATER EXCHANGE MODEL
EVAPORATION RATE
FORMULA OF ATMOSPHERIC RADIATION
LIGHTNESS OF THE SKY

2.15 PHYSICS

KINEMATIC WATER VISCOSITY WATER DENSITY

2.16 RESULTS

MASS-BALANCE
RESULTS FILE
WAQ VARIABLES TO BE PRINTED

2.17 SUSPENSION

DISPERSION ACROSS THE FLOW DISPERSION ALONG THE FLOW

2.18 WAQ PARAMETERS

AIR SPECIFIC HEAT

ALGAL TOXICITY COEFFICIENTS

BENTHIC DEMAND

COEFFICIENT OF CLOUDING RATE

COEFFICIENT OF DISTRIBUTION

COEFFICIENTS FOR CALIBRATING ATMOSPHERIC RADIATION

COEFFICIENTS FOR CALIBRATING SURFACE WATER RADIATION

COEFFICIENTS OF AERATION FORMULA

COEFFICIENTS OF ALGAL MORTALITY AT 20C

CONSTANT FOR THE NITRIFICATION KINETIC K520

CONSTANT OF DEGRADATION OF ORGANIC LOAD K1

CONSTANT OF DEGRADATION OF ORGANIC LOAD K120

CONSTANT OF DESORPTION KINETIC

CONSTANT OF HALF-SATURATION WITH NITROGEN

CONSTANT OF HALF-SATURATION WITH PHOSPHATE

CONSTANT OF NITRIFICATION KINETIC K4

CONSUMED OXYGEN BY NITRIFICATION

CRITICAL STRESS OF RESUSPENSION

EROSION RATE

EXPONENETIAL DESINTEGRATION CONSTANT

FORMULA FOR COMPUTING CS

FORMULA FOR COMPUTING K2

FORMULA FOR COMPUTING RS

K2 REAERATION COEFFICIENT

MAXIMUM ALGAL GROWTH RATE AT 20C

O2 SATURATION DENSITY OF WATER (CS)

OXYGENE PRODUCED BY PHOTOSYNTHESIS

PARAMETER OF CALIBRATION OF SMITH FORMULA

PERCENTAGE OF NITROGEN ASSIMILABLE IN DEAD PHYTO

PERCENTAGE OF PHYSPHORUS ASSIMILABLE IN DEAD PHYTO

PHOTOSYNTHESIS P PROPORTION OF NITROGEN WITHIN PHYTO CELLS PROPORTION OF PHOSPHORUS WITHIN PHYTO CELLS RATE OF TRANSFORMATION OF NOR TO NO3 RATE OF TRANSFORMATION OF POR TO PO4 RESPIRATION RATE OF ALGAL BIOMASS SECCHI DEPTH SEDIMENT SETTLING VELOCITY SEDIMENTATION CRITICAL STRESS SEDIMENTATION VELOCITY OF NON ALGAL NITROGEN SEDIMENTATION VELOCITY OF ORGANIC LOAD SEDIMENTATION VELOCITY OF ORGANIC PHOSPHORUS SUNSHINE FLUX DENSITY ON WATER SURFACE VEGERAL RESPIRATION R VEGETAL TURBIDITY COEFFICIENT WITHOUT PHYTO WATER SPECIFIC HEAT

2.19 WAQ PARAMETERS, SOURCES

WATER TEMPERATURE

COEFFICIENTS A AND B FOR RS FORMULA WEIR REAERATION COEFFICIENT RS

3. Glossary

3.1 English/French glossary

AIR SPECIFIC HEAT	CHALEUR SPECIFIQUE DE L'AIR
ALGAL TOXICITY COEFFICIENTS	COEFFICIENTS DE TOXICITE POUR
	LES ALGUES
ATMOSPHERE-WATER EXCHANGE MODEL	MODELE D'ECHANGES
	EAU-ATMOSPHERE
BENTHIC DEMAND	DEMANDE BENTHIQUE
BOUNDARY CONDITIONS FILE	FICHIER DES CONDITIONS AUX
	LIMITES
COEFFICIENT OF CLOUDING RATE	COEFFICIENT REPRESENTATIF DE LA
	COUVERTURE NUAGEUSE
COEFFICIENT OF DISTRIBUTION	COEFFICIENT DE DISTRIBUTION
COEFFICIENT TO CALIBRATE THE	COEFFICIENT DE CALAGE DU MODELE
ATMOSPHERE-WATER EXCHANGE MODEL	D'ECHANGES EAU-ATMOSPHERE
COEFFICIENTS A AND B FOR RS	COEFFICIENTS A ET B POUR LA
FORMULA	FORMULE DE RS
COEFFICIENTS FOR CALIBRATING	COEFFICIENTS DE CALAGE DU
ATMOSPHERIC RADIATION	RAYONNEMENT ATMOSPHERIQUE
COEFFICIENTS FOR CALIBRATING	COEFFICIENTS DE CALAGE DU
SURFACE WATER RADIATION	RAYONNEMENT DU PLAN D'EAU
COEFFICIENTS OF AERATION	COEFFICIENTS DE LA FORMULE
FORMULA	D'AERATION
COEFFICIENTS OF ALGAL MORTALITY	COEFFICIENTS DE MORTALITE
AT 20C	ALGALE A 20C
CONSTANT FOR THE NITRIFICATION	CONSTANTE DE LA CINETIQUE DE
KINETIC K520	NITRIFICATION K520
CONSTANT OF DEGRADATION OF	CONSTANTE DE DEGRADATION DE LA
ORGANIC LOAD K1	CHARGE ORGANIQUE K1
CONSTANT OF DEGRADATION OF	CONSTANTE DE DEGRADATION DE LA
ORGANIC LOAD K120	CHARGE ORGANIQUE K120
CONSTANT OF DESORPTION KINETIC	CONSTANTE CINETIQUE DE
	DESORPTION

CONSTANT OF HALF-SATURATION	CONSTANTE DE DEMI-SATURATION EN
WITH NITROGEN	AZOTE
CONSTANT OF HALF-SATURATION	CONSTANTE DE DEMI-SATURATION EN
WITH PHOSPHATE	PHOSPHATE
CONSTANT OF NITRIFICATION	CONSTANTE DE CINETIQUE DE
KINETIC K4	NITRIFICATION K4
CONSUMED OXYGEN BY	OXYGENE CONSOMME PAR
NITRIFICATION	NITRIFICATION
CRITICAL STRESS OF RESUSPENSION	CONTRAINTE CRITIQUE DE REMISE
CKITICAL SIKESS OF KESOSFENSION	EN SUSPENSION
DEBUGGER	DEBUGGER
DEFAULT EXECUTABLE	EXECUTABLE PAR DEFAUT
DEFAULT PARALLEL EXECUTABLE	EXECUTABLE PARALLELE PAR DEFAUT
DESCRIPTION OF LIBRARIES	DESCRIPTION DES LIBRAIRIES
DICTIONARY	DICTIONNAIRE
DISPERSION ACROSS THE FLOW	DISPERSION TRANSVERSALE
DISPERSION ALONG THE FLOW	DISPERSION LONGITUDINALE
EROSION RATE	TAUX D'EROSION
EVAPORATION RATE	TAUX D'EVAPORATION
EXPONENTIAL DESINTEGRATION	
CONSTANT	CONSTANTE DE DESINTEGRATION EXPONENETIELLE
FORMULA FOR COMPUTING CS	FORMULE DE CALCUL DE CS
FORMULA FOR COMPUTING K2	FORMULE DE CALCUL DE K2 FORMULE DE CALCUL DE RS
FORMULA FOR COMPUTING RS	
FORMULA OF ATMOSPHERIC RADIATION	FORMULE DU RAYONNEMENT
FORTRAN FILE	ATMOSPHERIQUE FICHIER FORTRAN
GEOMETRY FILE	FICHIER DE GEOMETRIE
GEOMETRY FILE FORMAT	FORMAT DU FICHIER DE GEOMETRIE
HYDRODYNAMIC FILE	FICHIER HYDRODYNAMIOUE
HYDRODYNAMIC FILE FORMAT	FORMAT DU FICHIER
HIDNODINAPHC FILE FORMAT	HYDRODYNAMIOUE
K2 REAERATION COEFFICIENT	COEFFICIENT DE REAERATION K2
KINEMATIC WATER VISCOSITY	VISCOSITE CINEMATIQUE EAU
LIGHTNESS OF THE SKY	CLARTE DU CIEL
LIST OF FILES	LISTE DES FICHIERS
MASS-BALANCE	BILAN DE MASSE
MAXIMUM ALGAL GROWTH RATE AT	TAUX DE CROISSANCE ALGALE
20C	MAXIMUM A 20C
METHOD OF COMPUTATION OF RAY	METHODE DE CALCUL DU
EXCTINCTION COEFFICIENT	COEFFICIENT D'EXTINCTION DU
	RAY
O2 SATURATION DENSITY OF WATER	CONCENTRATION DE SATURATION EN
(CS)	O2 DE L'EAU (CS)
OXYGENE PRODUCED BY	OXYGENE PRODUIT PAR
PHOTOSYNTHESIS	PHOTOSYNTHESE

	D1D1VEEDE DE 611-6
PARAMETER OF CALIBRATION OF	PARAMETRE DE CALAGE DE LA
SMITH FORMULA	FORMULE DE SMITH
PERCENTAGE OF NITROGEN	PERCENTAGE D'AZOTE ASSIMILABLE
ASSIMILABLE IN DEAD PHYTO	DANS LE PHYTO MORT
PERCENTAGE OF PHYSPHORUS	POURCENTAGE DE PHOSPHORE
ASSIMILABLE IN DEAD PHYTO	ASSIMILABLE DANS LE PHYTO MORT
PHOTOSYNTHESIS P	PHOTOSYNTHESE P
PROPORTION OF NITROGEN WITHIN	PROPORTION D'AZOTE DANS LES
PHYTO CELLS	CELLULES DU PHYTO
PROPORTION OF PHOSPHORUS WITHIN	PROPORTION DE PHOSPHORE DANS
PHYTO CELLS	LES CELLULES DU PHYTO
RATE OF TRANSFORMATION OF NOR	TAUX DE TRANSFORMATION DU NOR
TO NO3	EN NO3
RATE OF TRANSFORMATION OF POR	TAUX DE TRANSFORMATION DU POR
TO PO4	EN PO4
REFERENCE FILE	FICHIER DE REFERENCE
REFERENCE FILE FORMAT	FORMAT DU FICHIER DE REFERENCE
RELEASE	NUMERO DE VERSION
RESPIRATION RATE OF ALGAL	TAUX DE RESPIRATION DE LA
BIOMASS	BIOMASSE ALGALE
RESULTS FILE	FICHIER DES RESULTATS
RESULTS FILE FORMAT	FORMAT DU FICHIER DES RESULTATS
SECCHI DEPTH	PROFONDEUR DE SECCHI
SEDIMENT SETTLING VELOCITY	VITESSE DE CHUTE DES MES
SEDIMENTATION CRITICAL STRESS	CONTRAINTE CRITIQUE DE SEDIMENTATION
SEDIMENTATION VELOCITY OF NON	VITESSE DE SEDIMENTATION DE
ALGAL NITROGEN	L'AZOTE NON ALGALE
SEDIMENTATION VELOCITY OF	VITESSE DE SEDIMENTATION DE LA
ORGANIC LOAD	CHARGE ORGANIQUE
SEDIMENTATION VELOCITY OF	VITESSE DE SEDIMENTATION DU
ORGANIC PHOSPHORUS	PHOSPHORE ORGANIQUE
STEERING FILE	FICHIER DES PARAMETRES
SUNSHINE FLUX DENSITY ON WATER	DENSITE DE FLUX DU RAYONNEMENT
SURFACE	SOLAIRE A LA SURFACE
VALIDATION	VALIDATION
VARIABLES FOR WAQ PRINTOUTS	VARIABLES POUR LES SORTIES QE
VEGERAL RESPIRATION R	RESPIRATION VEGETALE R
VEGETAL TURBIDITY COEFFICIENT	COEFFICIENT DE TURBIDITE
WITHOUT PHYTO	VEGETALE SANS PHYTO
	TITRE DU CAS QE
WAQ CASE TITLE	-
WAQ VARIABLES TO BE PRINTED	VARIABLES QE A IMPRIMER
WATER DENSITY	MASSE VOLUMIQUE DE L'EAU
WATER QUALITY PRINTOUT PERIOD	PERIODE POUR LES SORTIES
	QUALITE D'EAU
WATER SPECIFIC HEAT WATER TEMPERATURE	CHALEUR SPECIFIQUE DE L'EAU TEMPERATURE DE L'EAU

WEIR REAERATION COEFFICIENT RS	COEFFICIENT DE REAERATION DU
	SEUIL RS

3.2 French/English glossary

BILAN DE MASSE	MASS-BALANCE
CHALEUR SPECIFIQUE DE L'AIR	AIR SPECIFIC HEAT
CHALEUR SPECIFIQUE DE L'EAU	WATER SPECIFIC HEAT
CLARTE DU CIEL	LIGHTNESS OF THE SKY
COEFFICIENT DE CALAGE DU MODELE	COEFFICIENT TO CALIBRATE THE
D'ECHANGES EAU-ATMOSPHERE	ATMOSPHERE-WATER EXCHANGE MODEL
COEFFICIENT DE DISTRIBUTION	COEFFICIENT OF DISTRIBUTION
COEFFICIENT DE REAERATION DU	WEIR REAERATION COEFFICIENT RS
SEUIL RS	
COEFFICIENT DE REAERATION K2	K2 REAERATION COEFFICIENT
COEFFICIENT DE TURBIDITE	VEGETAL TURBIDITY COEFFICIENT
VEGETALE SANS PHYTO	WITHOUT PHYTO
COEFFICIENT REPRESENTATIF DE LA	COEFFICIENT OF CLOUDING RATE
COUVERTURE NUAGEUSE	
COEFFICIENTS A ET B POUR LA	COEFFICIENTS A AND B FOR RS
FORMULE DE RS	FORMULA
COEFFICIENTS DE CALAGE DU	COEFFICIENTS FOR CALIBRATING
RAYONNEMENT ATMOSPHERIQUE	ATMOSPHERIC RADIATION
COEFFICIENTS DE CALAGE DU	COEFFICIENTS FOR CALIBRATING
RAYONNEMENT DU PLAN D'EAU	SURFACE WATER RADIATION
COEFFICIENTS DE LA FORMULE	COEFFICIENTS OF AERATION
D'AERATION	FORMULA
COEFFICIENTS DE MORTALITE	COEFFICIENTS OF ALGAL MORTALITY
ALGALE A 20C	AT 20C
COEFFICIENTS DE TOXICITE POUR	ALGAL TOXICITY COEFFICIENTS
LES ALGUES	
CONCENTRATION DE SATURATION EN	O2 SATURATION DENSITY OF WATER
O2 DE L'EAU (CS)	(CS)
CONSTANTE CINETIQUE DE	CONSTANT OF DESORPTION KINETIC
DESORPTION	
CONSTANTE DE CINETIQUE DE	CONSTANT OF NITRIFICATION
NITRIFICATION K4	KINETIC K4
CONSTANTE DE DEGRADATION DE LA	CONSTANT OF DEGRADATION OF
CHARGE ORGANIQUE K1	ORGANIC LOAD K1
CONSTANTE DE DEGRADATION DE LA	CONSTANT OF DEGRADATION OF
CHARGE ORGANIQUE K120	ORGANIC LOAD K120
CONSTANTE DE DEMI-SATURATION EN	CONSTANT OF HALF-SATURATION
AZOTE	WITH NITROGEN
CONSTANTE DE DEMI-SATURATION EN	CONSTANT OF HALF-SATURATION
PHOSPHATE	WITH PHOSPHATE
CONSTANTE DE DESINTEGRATION	EXPONENETIAL DESINTEGRATION
EXPONENETIELLE	CONSTANT

CONSTANTE DE LA CINETIQUE DE	CONSTANT FOR THE NITRIFICATION
NITRIFICATION K520	KINETIC K520
CONTRAINTE CRITIQUE DE REMISE	CRITICAL STRESS OF RESUSPENSION
EN SUSPENSION	
CONTRAINTE CRITIQUE DE	SEDIMENTATION CRITICAL STRESS
SEDIMENTATION	
DEBUGGER	DEBUGGER
DEMANDE BENTHIQUE	BENTHIC DEMAND
DENSITE DE FLUX DU RAYONNEMENT	SUNSHINE FLUX DENSITY ON WATER
SOLAIRE A LA SURFACE	SURFACE
DESCRIPTION DES LIBRAIRIES	DESCRIPTION OF LIBRARIES
DICTIONNAIRE	DICTIONARY
DISPERSION LONGITUDINALE	DISPERSION ALONG THE FLOW
DISPERSION TRANSVERSALE	DISPERSION ACROSS THE FLOW
EXECUTABLE PAR DEFAUT	DEFAULT EXECUTABLE
EXECUTABLE PARALLELE PAR DEFAUT	DEFAULT PARALLEL EXECUTABLE
FICHIER DE GEOMETRIE	GEOMETRY FILE
FICHIER DE REFERENCE	REFERENCE FILE
FICHIER DES CONDITIONS AUX	BOUNDARY CONDITIONS FILE
LIMITES	
FICHIER DES PARAMETRES	STEERING FILE
FICHIER DES RESULTATS	RESULTS FILE
FICHIER FORTRAN	FORTRAN FILE
FICHIER HYDRODYNAMIQUE	HYDRODYNAMIC FILE
FORMAT DU FICHIER DE GEOMETRIE	GEOMETRY FILE FORMAT
FORMAT DU FICHIER DE REFERENCE	REFERENCE FILE FORMAT
FORMAT DU FICHIER DES RESULTATS	RESULTS FILE FORMAT
FORMAT DU FICHIER	HYDRODYNAMIC FILE FORMAT
HYDRODYNAMIQUE	
FORMULE DE CALCUL DE CS	FORMULA FOR COMPUTING CS
FORMULE DE CALCUL DE K2	FORMULA FOR COMPUTING K2
FORMULE DE CALCUL DE RS	FORMULA FOR COMPUTING RS
FORMULE DU RAYONNEMENT	FORMULA OF ATMOSPHERIC
ATMOSPHERIQUE	RADIATION
LISTE DES FICHIERS	LIST OF FILES
MASSE VOLUMIQUE DE L'EAU	WATER DENSITY
METHODE DE CALCUL DU	METHOD OF COMPUTATION OF RAY
COEFFICIENT D'EXTINCTION DU	EXCTINCTION COEFFICIENT
RAY	
MODELE D'ECHANGES	ATMOSPHERE-WATER EXCHANGE MODEL
EAU-ATMOSPHERE	
NUMERO DE VERSION	RELEASE
OXYGENE CONSOMME PAR	CONSUMED OXYGEN BY
NITRIFICATION	NITRIFICATION
OXYGENE PRODUIT PAR	OXYGENE PRODUCED BY
PHOTOSYNTHESE	PHOTOSYNTHESIS

Bibliography 33

PARAMETRE DE CALAGE DE LA	PARAMETER OF CALIBRATION OF
FORMULE DE SMITH	SMITH FORMULA
PERCENTAGE D'AZOTE ASSIMILABLE	PERCENTAGE OF NITROGEN
DANS LE PHYTO MORT	ASSIMILABLE IN DEAD PHYTO
PERIODE POUR LES SORTIES	WATER QUALITY PRINTOUT PERIOD
QUALITE D'EAU	
PHOTOSYNTHESE P	PHOTOSYNTHESIS P
POURCENTAGE DE PHOSPHORE	PERCENTAGE OF PHYSPHORUS
ASSIMILABLE DANS LE PHYTO MORT	ASSIMILABLE IN DEAD PHYTO
PROFONDEUR DE SECCHI	SECCHI DEPTH
PROPORTION D'AZOTE DANS LES	PROPORTION OF NITROGEN WITHIN
CELLULES DU PHYTO	PHYTO CELLS
PROPORTION DE PHOSPHORE DANS	PROPORTION OF PHOSPHORUS WITHIN
LES CELLULES DU PHYTO	PHYTO CELLS
RESPIRATION VEGETALE R	VEGERAL RESPIRATION R
TAUX D'EROSION	EROSION RATE
TAUX D'EVAPORATION	EVAPORATION RATE
TAUX DE CROISSANCE ALGALE	MAXIMUM ALGAL GROWTH RATE AT
MAXIMUM A 20C	20C
TAUX DE RESPIRATION DE LA	RESPIRATION RATE OF ALGAL
BIOMASSE ALGALE	BIOMASS
TAUX DE TRANSFORMATION DU NOR	RATE OF TRANSFORMATION OF NOR
EN NO3	TO NO3
TAUX DE TRANSFORMATION DU POR	RATE OF TRANSFORMATION OF POR
EN PO4	TO PO4
TEMPERATURE DE L'EAU	WATER TEMPERATURE
TITRE DU CAS QE	WAQ CASE TITLE
VALIDATION	VALIDATION
VARIABLES POUR LES SORTIES QE	VARIABLES FOR WAQ PRINTOUTS
VARIABLES QE A IMPRIMER	WAQ VARIABLES TO BE PRINTED
VISCOSITE CINEMATIQUE EAU	KINEMATIC WATER VISCOSITY
VITESSE DE CHUTE DES MES	SEDIMENT SETTLING VELOCITY
VITESSE DE SEDIMENTATION DE	SEDIMENTATION VELOCITY OF NON
L'AZOTE NON ALGALE	ALGAL NITROGEN
VITESSE DE SEDIMENTATION DE LA	SEDIMENTATION VELOCITY OF
CHARGE ORGANIQUE	ORGANIC LOAD
VITESSE DE SEDIMENTATION DU	SEDIMENTATION VELOCITY OF
PHOSPHORE ORGANIQUE	ORGANIC PHOSPHORUS

- [1] JOLY A., GOEURY C., and HERVOUET J.-M. Adding a particle transport module to telemac-2d with applications to algae blooms and oil spills. Technical Report H-P74-2013-02317-EN, EDF R&D-LNHE, 2013.
- [2] AUTHOR. Title. Journal de Mickey, 666.
- [3] PHAM C.-T., BOURBAN S., DURAND N., and TURNBULL M. Méthodologie pour la simulation de la marée avec la version 6.2 de telemac-2d et telemac-3d. Technical Report H-P74-2012-02534-FR, EDF R&D-LNHE, 2012.
- [4] Sampath Kumar Gurram, Karam S. Karki, and Willi H. Hager. Subcritical junction flow. *Journal of Hydraulic Engineering*, 123(5):447–455, may 1997.
- [5] TSANIS I. Simulation of wind-induced water currents. *Journal of hydraulic Engineering*, 115(8):1113–1134, 1989.
- [6] SMAGORINSKY J. General simulation experiments with the primitive equations. *Monthly Weather Review*, 91(3):99–164, March 1963.
- [7] HERVOUET J.-M. *Méthodes itératives pour la solution des systèmes matriciels*. Rapport EDF HE43/93.049/A, 1996.
- [8] HERVOUET J.-M. Hydrodynamics of Free Surface Flows. Modelling with the finite element method. Wiley, 2007.
- [9] HERVOUET J.-M. Guide to programming in the telemac system version 6.0. Technical Report H-P74-2009-00801-EN, EDF R&D-LNHE, 2009.
- [10] JANIN J.-M., HERVOUET J.-M., and MOULIN C. A positive conservative scheme for scalar advection using the M.U.R.D technique in 3D free-surface flow problems. XIth International Conference on Computional methods in water resources, 1996.
- [11] GAUTHIER M. and QUETIN B. Modèles mathématiques de calcul des écoulements induits par le vent. In *17e congrès de l'AIRH*, Baden-Baden, August 1977.
- [12] METCALF M. and REID J. Fortran 90 explained. Oxford Science Publications, 1990.