

INI-files SOBEK 2

Description of the used INI-files in SOBEK 2

Technical Reference Manual

Version: 0.00
SVN Revision: 46106

17 March 2023

INI-files SOBEK 2, Technical Reference Manual

Published and printed by:

Deltares
Boussinesqweg 1
2629 HV Delft
P.O. 177
2600 MH Delft
The Netherlands

telephone: +31 88 335 82 73
e-mail: info@deltares.nl
www: <https://www.deltares.nl>

For sales contact:

telephone: +31 88 335 81 88
e-mail: software@deltares.nl
www: <https://www.deltares.nl/software>

For support contact:

telephone: +31 88 335 81 00
e-mail: software.support@deltares.nl
www: <https://www.deltares.nl/software>

Copyright © 2023 Deltares

All rights reserved. No part of this document may be reproduced in any form by print, photo print, photo copy, microfilm or any other means, without written permission from the publisher: Deltares.

Contents

1	SOBEKSIM.INI	1
1.1	Time step estimation	1
1.2	General	1
1.3	InitialConditions	1
1.4	RunoffOptions	2
1.5	ResultsNodes	2
1.6	ResultsBranches	4
1.7	ResultsStructures	6
1.8	ResultsPumps	7
1.9	ResultsGeneral	7
1.10	ResultsGrid	8
1.11	Sediment	8
1.12	Specials	8
1.13	Indication	8
1.14	NumericalParameters	9
1.15	SimulationOptions	11
1.16	SteadyState	17
1.17	Salinity	17
1.18	AdvancedOptions	18
1.19	Overland Flow	18
1.20	ResultsARCVIEW	19

DRAFT

1 SOBEKSIM.INI

1.1 Time step estimation

for all 1D links:

$$facsum = \sum_{m=1}^{n_{links}} \left(\frac{q_m}{vl1_m Up} \right)^2 \quad (1.1)$$

$$facmax = \max \left(\frac{q_m}{vl1_m Up} \right), m = 1..n_{links} \quad (1.2)$$

For all 2d links:

$$facsum = \sum_{m=1}^{n_{links}} \left(\frac{u_m}{dx_m} \right)^2 \quad (1.3)$$

$$facmax = \max \left(\frac{u_m}{dx_m} \right), m = 1..n_{links} \quad (1.4)$$

For all links

$$facavg = \frac{facsum}{n_{links}} \quad (1.5)$$

$$dt = \max \left(dt_{min}, \frac{Cfl_{limiter}}{facmax} \right) \quad (1.6)$$

1.2 General

Keyword:	Version
Default:	PLUV2.70
Description:	

Keyword:	Language
Default:	1
Description:	

1.3 InitialConditions

Keyword: InitialEmptyWells
Default: 0
Description: Switch for starting with dry system; 1 = on, 0 = off

Keyword: InitialSalinity
Default: 0.0
Description:

1.4 RunoffOptions

Keyword: FixedQlatAtBranch
Default: -1 (true)
Description: If FixedQlatAtBranch = True then SplitQlatAtBranch = False

Keyword: MultipleStormEvents
Default: 0 (false)
Description:

Keyword: SplitQlatAtBranch
Default: 0 (false)
Description:

1.5 ResultsNodes

Keyword: Density
Default: 0
Description:

Keyword: Dispersion
Default: 0
Description:

Keyword: Freeboard
Default: 0
Description:

Keyword: LateralToGW

Default: 0

Description:

Keyword: LateralOnNodes

Default: 0

Description:

Keyword: LateralToTrench

Default: 0

Description:

Keyword: LevelFromStreetLevel

Default: 0

Description:

Keyword: RunOff

Default: 0

Description:

Keyword: Salinity

Default: 0

Description:

Keyword: TimeWaterOnStreet

Default: 0

Description:

Keyword: TotalArea

Default: 0

Description:

Keyword: TotalWidth

Default: 0

Description:

Keyword: Volume

Default: 0

Description:

Keyword: VolumeError

Default: 0

Description:

Keyword: VolumInTrench

Default: 0

Description:

Keyword: VolumesOnStreet

Default: 0

Description:

Keyword: WaterDepth

Default: 0

Description:

Keyword: WaterLevel

Default: -1

Description:

Keyword: WaterLevelInTrench

Default: 0

Description:

Keyword: WaterOnStreet

Default: 0

Description:

1.6 ResultsBranches

Keyword: Chezy

Default: 0

Description:

Keyword: Discharge

Default: -1

Description:

Keyword: EnergyHeadMethod

Default: 0

Description: The energy levels are computed, when LevelsOutputOnPipes/=0
 EnergyHeadMethod/10 ==1: the water level at the gridpoint is used
 EnergyHeadMethod/10 ==2: the water level is computed, taking the Froude number into account
 Mod(EnergyHeadMethod,10) == 1: the velocity in the velocity point is used
 Mod(EnergyHeadMethod,10) == 2: the velocity is computed by Q/A

Keyword: Levelsoutputonpipes

Default: 0

Description:

Keyword: RiverSubsectionParameters

Default: 0

Description:

Keyword: SedimentFrijlink

Default: 0

Description:

Keyword: SedimentVanRijn

Default: 0

Description:

Keyword: Velocity

Default: 0

Description:

Keyword: WaterLevelSlope

Default: 0

Description:

Keyword: Wind

Default: 0

Description:

Keyword: TWind

Default: 0

Description:

Keyword: FWind

Default: 0

Description:

1.7 ResultsStructures

Keyword:	CrestLevel
Default:	0
Description:	
Keyword:	CrestWidth
Default:	0
Description:	
Keyword:	Discharge
Default:	1
Description:	
Keyword:	GateLowerEdgeLevel
Default:	0
Description:	
Keyword:	Head
Default:	0
Description:	
Keyword:	OpeningsArea
Default:	0
Description:	
Keyword:	PressureDifference
Default:	0
Description:	
Keyword:	ThresholdForSpillCountInHours
Default:	1000
Description:	ThresholdForSpillCountInHours=12 This means that if a structure does not work for more than 12 hours, and then starts again, that you have 2 spills (and later maybe even 3 or more).
Keyword:	Velocity
Default:	0
Description:	
Keyword:	WaterLevel
Default:	0
Description:	Water levels upstream and downstream of structure

Keyword: Waterleveloncrest
Default: 0
Description:

1.8 ResultsPumps

Keyword: PumpResults
Default: 0
Description:

1.9 ResultsGeneral

Keyword: ActualValue
Default: -1 (true)
Description: ActualValue, MaximumValue and MeanValue are mutual exclusive

Keyword: DelwaqNoStaggeredGrid
Default: 0 (false)
Description:

Keyword: FlowAnalysisTimeSeries
Default: 0 (false)
Description:

Keyword: MaximumValue
Default: 0 (false)
Description: ActualValue, MaximumValue and MeanValue are mutual exclusive

Keyword: MeanValue
Default: 0 (false)
Description: ActualValue, MaximumValue and MeanValue are mutual exclusive

Keyword: SobeksimStamp
Default: 0
Description:

Keyword: Zero2DRainEvap2Delwaq
Default: 0 (false)
Description:

1.10 ResultsGrid

Keyword: 1DFlowDischargeMeasuringSection
Default: 0
Description:

1.11 Sediment

Keyword: DepthUsedForSediment
Default: 0.3
Description:

Keyword: D50
Default: 0.0005
Description:

Keyword: D90
Default: 0.0010
Description:

1.12 Specials

Keyword: DesignFactorDLG
Default: 1.0
Description: Design Factor used in the Rational Method

1.13 Indication

Keyword: VelocityBranchSegments
Default: 0.5
Description:

Keyword: VelocityStructures

Default: 0.75

Description:

1.14 NumericalParameters

Keyword: AccelerationTermFactor

Default: 1.0

Description:

Keyword: AccurateVersusSpeed

Default: 3

Description: Iteration criteria:
 1 = Less Accurate / Fast (1.0E-6)
 2 = Medium (1.0E-9)
 3 = Accurate / Slow (1.0E-12)

Keyword: CourantNumber

Default: 1

Description: Maximum allowable Courant number Cfl_{max} .

Keyword: DtMinimum

Default: 0.01

Description: Minimum time step for the Courant time step estimation dt_{min} (source code: dt_{pluv_min})

Keyword: EpsilonValueVolume

Default: 0.005

Description: Source code name *epsvol*. Accuracy factor for volumes.

Keyword: EpsilonValueWaterDepth

Default: 0.005

Description: Source code name *epss*. Accuracy factor for water levels.

Keyword: FloodingDividedByDrying

Default: 2.0

Description:

Keyword: Gravity

Default: 9.81

Description:

Keyword: MaxDegree

Default: 2

Description:

Keyword: MaxIterations

Default: 8

Description:

Keyword: MinimumSurfaceatStreet

Default: 0.1

Description:

Keyword: MinimumSurfaceinNode

Default: 0.1

Description:

Keyword: MinimumLength

Default: 1.0

Description:

Keyword: RelaxationFactor

Default: 1.0

Description:

Keyword: Rho

Default: 1000

Description:

Keyword: StructureInertiaDampingFactor

Default: 1.0

Description:

Keyword: Theta

Default: 1.0

Description:

Keyword: ThresholdValueDrying

Default: 0.005 (ThresholdValueFlooding/FloodingDividedByDrying)

Description:

Keyword: ThresholdValueFlooding

Default: 0.01

Description:

Keyword: ThresholdValueDryingFLS

Default: 0.0005 (ThresholdValueFloodingFLS/FloodingDividedByDrying)

Description:

Keyword: ThresholdValueFloodingFLS

Default: 0.001

Description:

Keyword: UseTimeStepReducerStructures

Default: 0 (false)

Description: Source code name *structimestepreducer*.
 When at the end of the calculation of a time step a weir or orifice is assumed to be dry ($kfu(m) == 0$), but on one side or both sides of this structure the water level is above the crest level there is a contradiction. This can be the result of an oscillation, therefore the time step is reduced and the current time step is recomputed.

1.15 SimulationOptions

Keyword: AllowableLargerTimestep

Default: 0

Description: In source code denoted as *largerdt*. As long as the number of iterations is less than *largerdt* Cfl_{div} can be reduced for each time step by:

$$Cfl_{div} = \max(0.01, \frac{facavg}{facmax}, \sqrt{0.5} \cdot Cfl_{div}) \quad (1.7)$$

When the number of iterations exceeds *largerdt* Cfl_{div} remains unchanged. This seems to be a bug since two lines of code is used to leave Cfl_{div} unchanged.

Keyword: AllowableTimeStepLimiter
Default: 30
Description: Variable *maxlimitdt* in *limitdt* is set to *maxlimitdt*, in subroutine SETBACK. In subroutine PLDTMX (estimation of the new time step) *limitdt* is set to *limitdt* -1. As long as *limitdt* > 0 a more conservative time step estimation is used:

$$Cfl_{limiter} = 0.9 \cdot \frac{Cfl_{max}}{Cfl_{div}} \quad (1.8)$$

Keyword: ASCIIFileUVComponent
Default: 1 (true)
Description: In source code set to true anyway, so always true.

Keyword: Cflcheckalllinks
Default: 0 (false)
Description:

Keyword: Channel
Default: 1 (true)
Description:

Keyword: Debug
Default: 0
Description:

Keyword: DebugTime
Default: 0
Description:

Keyword: DepthsBelowBobs
Default: 0
Description:

Keyword: DispMaxFactor
Default: 0.45
Description:

Keyword: DumpInput
Default: 0
Description:

Keyword: ladvec1D
Default: 1
Description: Advection Type in 1D Flow
ladvec1D = 1: Conservation of Momentum
ladvec1D = 2: Balanced Average of Conservation of Momentum and Conservation of Energy in Contraction and Expansion
ladvec1D = 3: Balanced Average of Conservation of Momentum and Conservation of Energy in Contraction Only
ladvec1D = 4: Balanced Average of Conservation of Momentum and Conservation of Energy in Expansion Only
ladvec1D = 5: Balanced Average of Conservation of Momentum and Conservation of Energy but no Contraction and Expansion Losses

Keyword: Limtyphu1D
Default: 1
Description: Limiter Type for Estimating Flow Area at Velocity Point in 1D Flow
Limtyphu1D = 1: Upwind
Limtyphu1D = 2: Central in Cross-Sections
Limtyphu1D = 3: Central in Water Levels

Keyword: Manhloss
Default: 0
Description:

Keyword: MaxAdjacentEdges
Default: 20
Description:

Keyword: MissingValue
Default: -999.999
Description:

Keyword: Momdilution1D
Default: 1
Description: Advection Control Volume Based upon Flow Area or Total Area in 1D Links
Momdilution1D = 1: Total Area
Momdilution1D = 2: Flow Area with Account for Storage Sink Term
Momdilution1D = 3: Flow Area

Keyword: OnlineCommunicationFile
Default: "
Description:

Keyword: Onlineplot

Default: 0 (false)

Description:

Keyword: OnLineWQ

Default: 0 (false)

Description:

Keyword: PercentAllowableVolumeError

Default: 1

Description:

Keyword: PreissmannMinClosedManholes

Default: 0.001

Description:

Keyword: Readsamples

Default: 0 (false)

Description:

Keyword: River

Default: 0 (false)

Description:

Keyword: RTCInUse

Default: 0

Description:

Keyword: RunoffInUse

Default: 0

Description:

Keyword: Salinity

Default: 0

Description:

Keyword: Sewer

Default: 0

Description:

Keyword: SimulationSynchron

Default: 0

Description:

Keyword: SiphonUpstreamThresholdSwitchOff

Default: 0.1

Description:

Keyword: Skipstructimestepreduction

Default: 0

Description: Weirs and orifices can oscillate and for both structure types the flow direction can be limited to one direction only. When at the end of the iteration loop, the computed flow direction is incorrect, the time step is reduced and the current time step is recomputed. When "Skipstructimestepreduction" is set to true, this check is not performed.

Keyword: StrucFlowDirectionAccuracyFactor

Default: 1.0

Description: source code name *sfda_factor*. The accuracy factor used in Skipstructimestepreduction is equal to $StrucFlowDirectionAccuracyFactor \cdot EpsilonValueWaterDepth$

Keyword: StructureStabilityFactor

Default: 0

Description:

Keyword: ThresholdForSummerDike

Default: 0.4

Description:

Keyword: TimersOutputFrequency

Default: 1

Description:

Keyword: Treat2DFrictiontermsameas1D

Default: 0 (false)

Description:

Keyword: Use1D2DNode

Default: -1 (true)

Description:

Keyword: Use1D2DRestartInputFile

Default: 0 (false)

Description:

Keyword: Use1D2DRestartOutputFile
Default: 0 (false)
Description:

Keyword: Use2DWindFrictSameAs1DFormulation
Default: -1 (true)
Description:

Keyword: UseExtraFrictionDepth1D
Default: -1 (true)
Description:

Keyword: UseFls
Default: 0 (false)
Description:

Keyword: UseGridAsSurface
Default: -1 (true)
Description:

Keyword: UseTimers
Default: 0 (false)
Description:

Keyword: Usevariableteta
Default: 0 (false)
Description:

Keyword: VolumeCheck
Default: 0 (false)
Description:

Keyword: Writesamples
Default: 0 (false)
Description:

1.16 SteadyState

Keyword: ComputeSteadyState

Default: 0 (false)

Description:

Keyword: Dtsteady

Default: 7200

Description:

Keyword: EpsMaxU

Default: 1e-6

Description:

Keyword: Ntendcontrolsteady

Default: 200

Description:

Keyword: Ntintcontrolsteady

Default: 20

Description:

Keyword: Ntmaxsteady

Default: 1500

Description:

1.17 Salinity

Keyword: DiffusionAtBoundaries

Default: false

Description:

Keyword: SaltComputation

Default: 0 (false)

Description:

1.18 AdvancedOptions

Keyword:	CalculateDelwaqOutput
Default:	0 (false)
Description:	
Keyword:	ExtraResistanceGeneralStructure
Default:	0.0
Description:	
Keyword:	LateralLocation
Default:	1
Description:	0 = Laterals at Nearest Water Level Point 1 = Laterals at Lowest Water Level Point
Keyword:	MaxLoweringCrossAtCulvert
Default:	0.0
Description:	
Keyword:	MaxVolFact
Default:	0.9
Description:	
Keyword:	NoNegativeQlatWhenThereIsNoWater
Default:	0
Description:	
Keyword:	TransitionHeightSD
Default:	1.0
Description:	

1.19 Overland Flow

Keyword:	2DEddyViscosity
Default:	0.0
Description:	
Keyword:	DefaultChezy1D2DConnections
Default:	1000
Description:	

Keyword: Limtyp

Default: 1

Description:

Keyword: NorocoBufferFactor

Default: 2

Description: Factor for allocating memory for irocol table, if array size to small, increase buffer

Keyword: Noslip

Default: 0

Description:

1.20 ResultsARCVIEW

Keyword: FilePath

Default: ../WORK/

Description:

Keyword: UvelocityVvelocityResultingvelocityNoDecimalsInASCIIMapFiles

Default: 4

Description:

Keyword: WaterlevelWaterdepthBedlevelNoDecimalsInASCIIMapFiles

Default: 4

Description:

Deltares, 2016. "BIBTEX key with no entry, needed if no citations are made in the document."